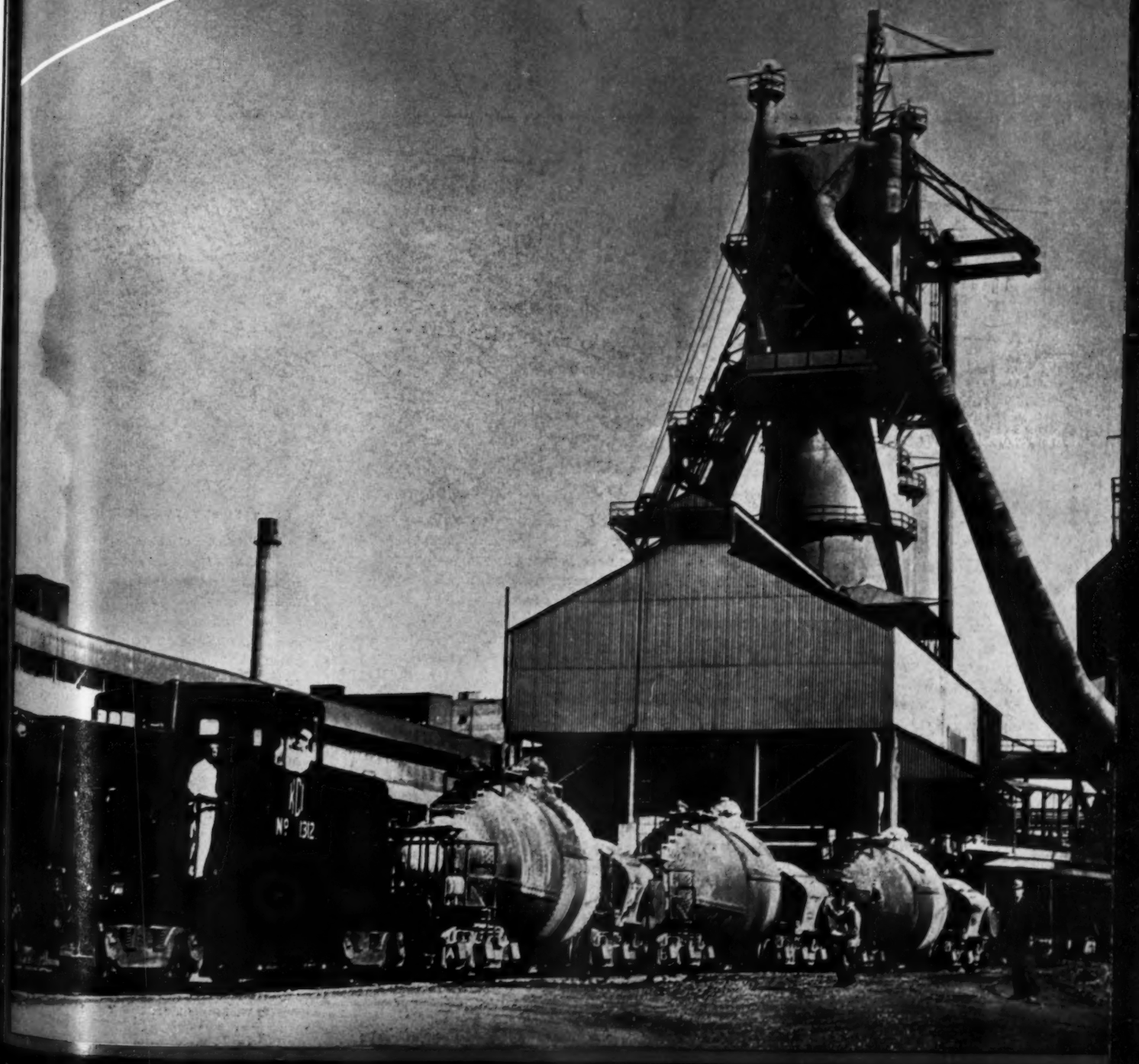
...c. 90
..... 92
..... 137
..... 136
..... 130
..... 109
..... 11
..... 137
..... 136
..... 132
...22, 117
..... 100
..... 111
..... 44
..... 136
..... 46
..... 45
..... 7
..... 97
..... 129
..... 26
..... 91
..... 13
..... 135
..... 25
..... 37
..... 134
..... 112
..... 132
..... 137
..... 18
..... 131
..... 138
....50-51
..... 127
..... 134
..... 135
..... 137
..... 94
..... 125
..... 99
..... 129
..... 134
..... 137
..... 43
..... 135
..... 41
..... 81
..... 86
..... 27
..... 38
..... 135
..... 95
..... 102
..... 98
..... 133
..... 122
d Cover
...20-21
...186
..... 36
..... 28
..... 108
..... 83
..... 135
..... 115
..... 10
..... 135
..... 136
..... 113
..... 88
..... 131
..... 87
..... 118
..... 135
..... 29
..... 35

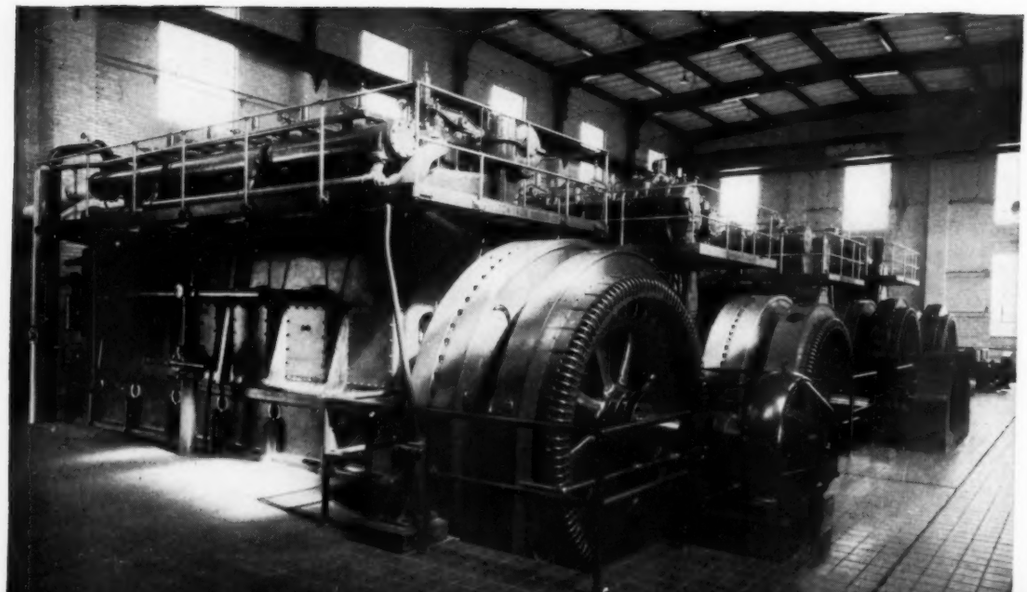
PROGRESS

DIESEL PROGRESS



OCTOBER, 1945

FIVE DOLLARS PER YEAR—FIFTY CENTS PER COPY



DIESEL OPERATING COSTS GO DOWN

when you lubricate with oils that . . .

- ★ Keep rings free, valves active
- ★ Assure piston seal—full compression
- ★ Prevent scuffing, greatly reduce wear
- ★ Prevent varnish and sludge

  Protect modern bearings

THESE benefits—yours when you lubricate your Diesels with *Texaco Ursa Oils*—add up to extra thousands of hours of trouble-free service between overhauls, longer life for rings, pistons, liners and bearings, full power output with minimum fuel consumption.

Texaco Ursa Oils are typical examples of petroleum products improved through The Texas Company's constant research. They are made in one of the world's largest refineries from carefully selected crudes processed by modern Texaco methods to provide efficient and economical Diesel operation. Their production is 100% Texaco controlled from well to finished product to assure absolute uniformity.

These are some of the reasons why *Texaco Ursa Oils* are approved by all leading Diesel engine manufacturers, and why—

More stationary Diesel hp. in the U.S. is lubricated with Texaco than with any other brand.

Texaco Lubrication Engineers specializing in Diesel lubrication are available to you upon request. Get in touch with the nearest of more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

FOR EVERY TYPE OF DIESEL

Effective lubrication of a Diesel engine calls for an oil especially designed for the particular type of engine and the service for which the engine is built. To meet this requirement, The Texas Company, in step with improvements in Diesel engine design over the past thirty years, has developed *a complete line* of Texaco Ursa Oils . . . one to meet the requirements of every type and size of Diesel, from the smallest high-speed portables to the largest stationary and marine installations. When a Texaco Lubrication Engineer recommends a particular grade of Ursa, you can be sure it is the right oil for maximum efficiency and minimum fuel consumption.

TEXACO

TEXACO URSA OILS

FOR ALL DIESEL ENGINES

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

DIESEL PROGRESS, for October, 1945. Volume XI, Number 10. DIESEL PROGRESS is published monthly by Diesel Engines, Inc., 2 W. Forty-fifth St., New York 19, N. Y. Rex W. Wadman, President. Acceptance under the Act of June 5, 1943, at East Stroudsburg, Pa., authorized March 27, 1940. Subscription rates: $5.00 per year, single copy, 50c

DIESEL and GAS ENGINE PROGRESS

REX W. WADMAN
Editor and Publisher

WILBUR W. YOUNG
Managing Editor

HEYWORTH CAMPBELL
Art Director

OCTOBER CONTENTS

Contractor Uses Diesels On Farm and Construction Jobs 55
Saga Of The Diesel Ship "St. Roch" 56
Lake Mills, Iowa 60
Diesel and Gas-Turbine Compared 62
A New Diesel Enters The Marine Field 68
Diesel Dealer Played Spectacular War Role 72
Railroad Maintenance Depends On Diesel Maintenance 76
Legal News 80
Supervising and Operating Engineers' Section 82
Exchange Your Diesel Maintenance Ideas Section .. 84

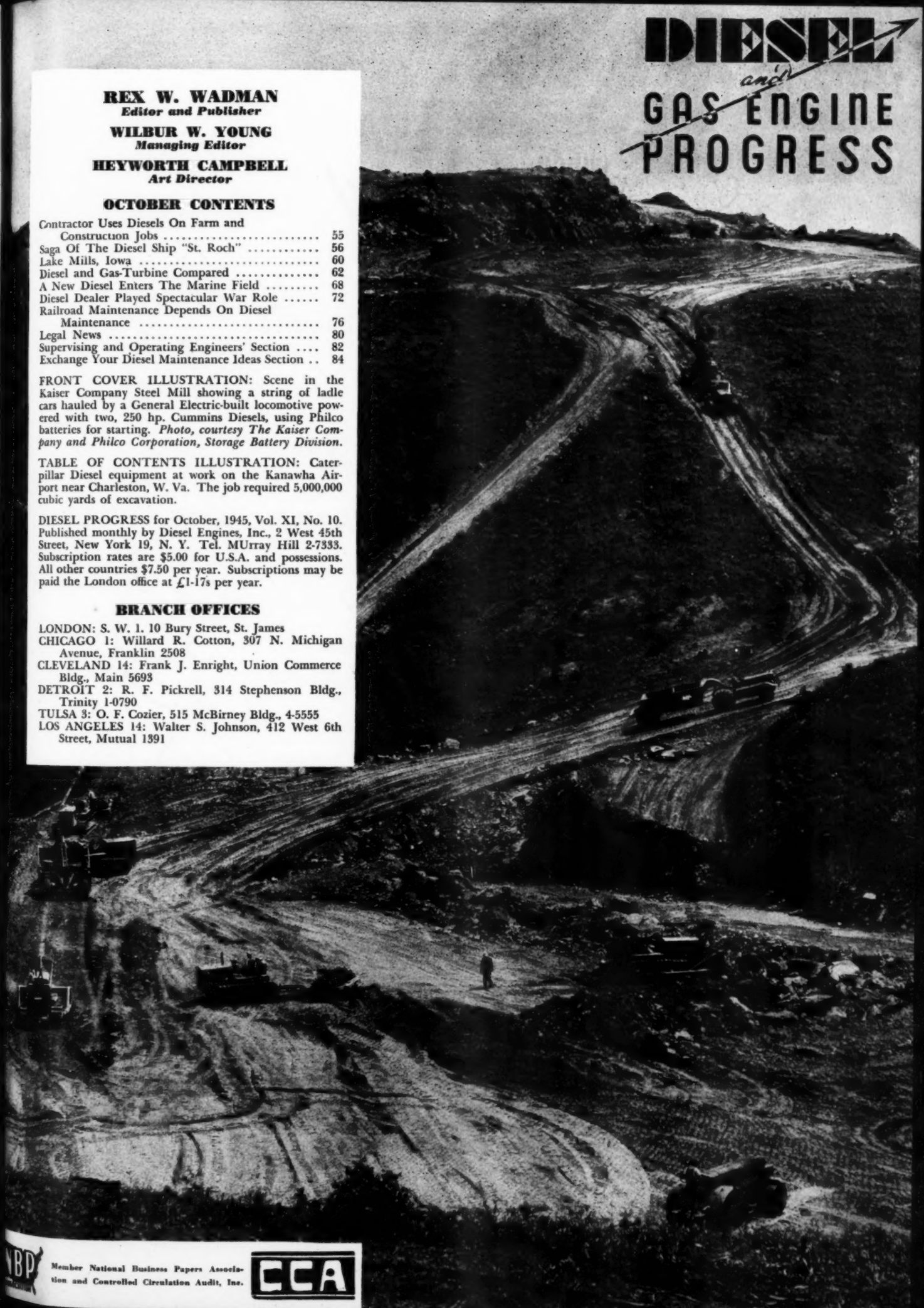
FRONT COVER ILLUSTRATION: Scene in the Kaiser Company Steel Mill showing a string of ladle cars hauled by a General Electric-built locomotive powered with two, 250 hp. Cummins Diesels, using Philco batteries for starting. *Photo, courtesy The Kaiser Company and Philco Corporation, Storage Battery Division.*

TABLE OF CONTENTS ILLUSTRATION: Caterpillar Diesel equipment at work on the Kanawha Airport near Charleston, W. Va. The job required 5,000,000 cubic yards of excavation.

DIESEL PROGRESS for October, 1945, Vol. XI, No. 10. Published monthly by Diesel Engines, Inc., 2 West 45th Street, New York 19, N. Y. Tel. MUrray Hill 2-7333. Subscription rates are $5.00 for U.S.A. and possessions. All other countries $7.50 per year. Subscriptions may be paid the London office at £1-17s per year.

BRANCH OFFICES

LONDON: S. W. 1. 10 Bury Street, St. James
CHICAGO 1: Willard R. Cotton, 307 N. Michigan Avenue, Franklin 2508
CLEVELAND 14: Frank J. Enright, Union Commerce Bldg., Main 5693
DETROIT 2: R. F. Pickrell, 314 Stephenson Bldg., Trinity 1-0790
TULSA 3: O. F. Cozier, 515 McBirney Bldg., 4-5555
LOS ANGELES 14: Walter S. Johnson, 412 West 6th Street, Mutual 1391



Member National Business Papers Association and Controlled Circulation Audit, Inc.

WHICH Oil GOES INTO YOUR ENGINES?

A LAZY OIL
that only lubricates

DON'T be too quick to blame your engines if they're not turning in the kind of performance they should. It may be your oil is "laying down on the job." For an oil that's lazy . . . doesn't do its full quota of work . . . can cause plenty of engine trouble.

Quite a few operators who have a wartime obligation to fill are taking no chances . . . have switched to hard working Shell Talpex, the oil that does all the jobs necessary to keep engines running at peak efficiency.

If the oil you now use is not doing all these jobs, it's lazy—should be changed to hard-working Talpex. Ask the Shell man to show you why.

Shell Oil Company, Inc., 50 West 50th Street, New York 20, N. Y.—100 Bush Street, San Francisco 6, California.

SHELL **TALPEX**

THE ALL-PURPOSE, HEAVY-DUTY LUBRICANT

For trucks, buses, tractors, shovels, stationary and marine Diesels

. . . OR

HARD-WORKING

TALPEX

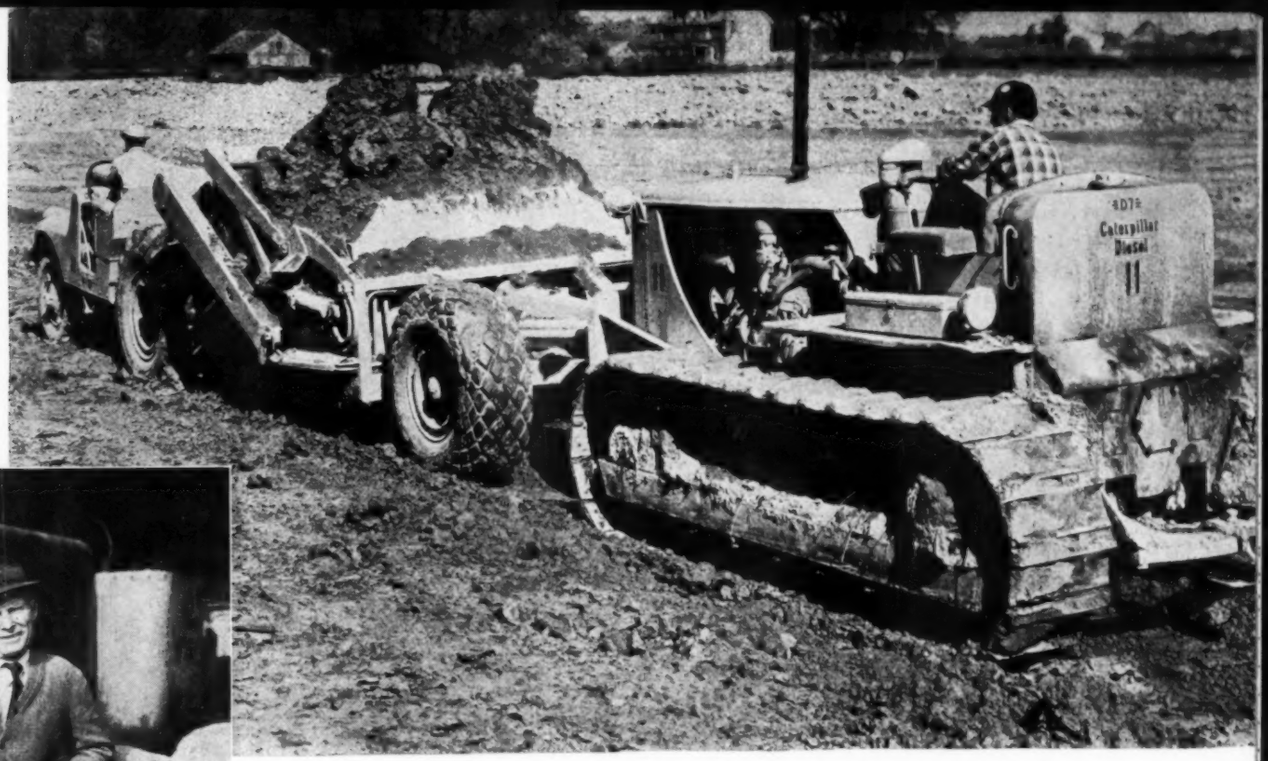
that lubricates and does 4 extra jobs

1. Has high detergency. Helps keep carbon, lacquer and foreign particles from adhering to pistons and rings, valves, ports.

2. Has exceptional Oxidation Stability. Holds to a minimum the formation of sludge, lacquer and other products of deterioration.

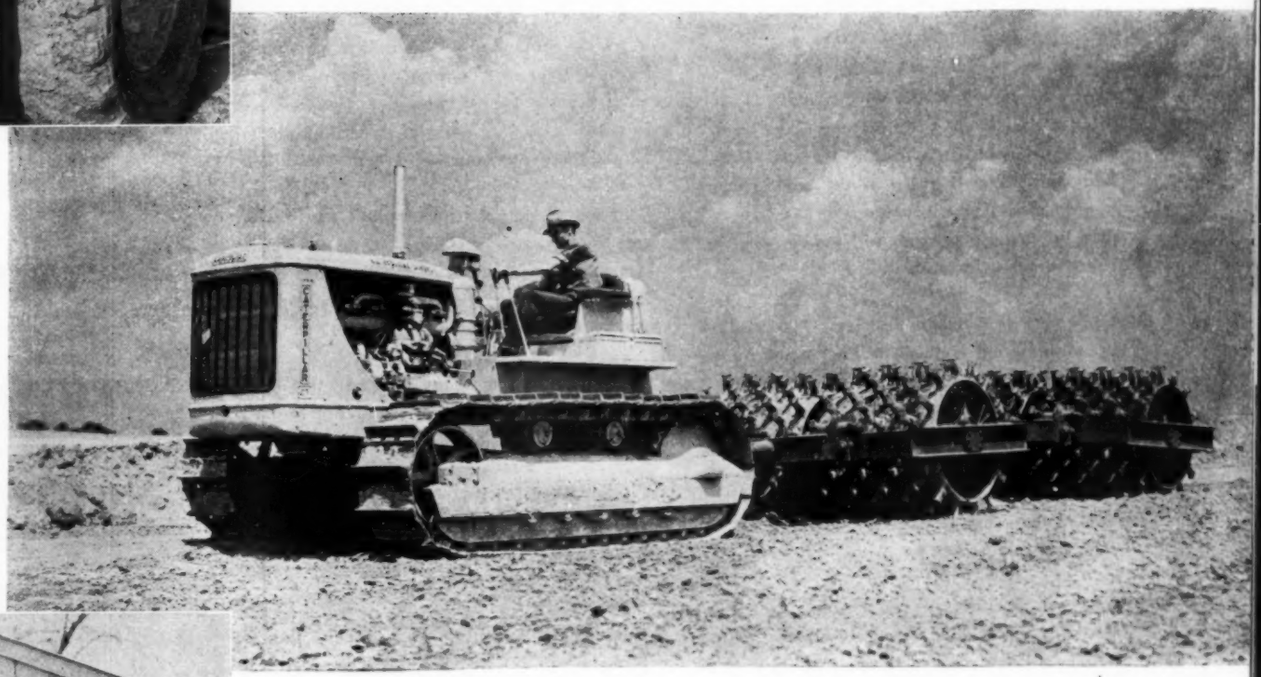
3. Has low Carbon-Forming Tendency. Reduces ring sticking and wear. Lengthens engine life.

4. Is non-corrosive to alloy bearings. Protects all lubricated engine parts against corrosion.



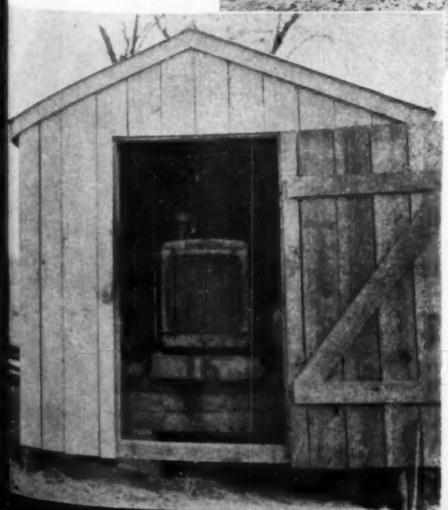
A Caterpillar Diesel tractor ahead with scraper and another behind, push-dozing, making a fill for railroad siding into Army Ammunition Depot. Equipment is owned by Ralph E. Dutcher Construction Co., Elkton, Maryland.

E. Dutcher, president of Dutcher Construction , Queenstown, Md.— ner of Caterpillar trac- fleet, motor graders, el-electric sets, totaling pieces of equipment.



Caterpillar Diesel tractor and sheepsfoot tamper on airport fill at New Castle, Delaware.

ii Caterpillar Diesel es a generator supply- current to operate a 000 bu. grain elevator, hts and various barn ma- nery, on the Wye River ms of R. E. Dutcher, enstown, Maryland.



DIESEL TRACTORS DOUBLE ON CONSTRUCTION AND FARM JOBS

L PROGRESS

Reprinted by Permission*

TWICE THROUGH NORTHWEST PASSAGE

THE St. Roch was built by the Burrard Drydock Company, Ltd. of North Vancouver, B.C. Her lines were drawn by T. Halliday, naval architect, of Vancouver, and her plans and specifications were by Charles Duguid, naval constructor to the Department of Marine, Ottawa.

As she was intended to remain in the Arctic four or five years at a time, if necessary, due regard was had to the suitability of her machinery for prolonged heavy service, its probable freedom from breakdowns and the number of spare parts to be carried. After this consideration, and in view of the experience the Hudson's Bay Company had had with Union engines, a Union Diesel engine of 150 horsepower was selected.

After her first voyage through the Northwest Passage this engine was replaced with a 300-horsepower, six-cylinder Union Diesel. Owing to advances in design, it was possible to place this larger engine in the same engine room as the original. Both engines were equipped with sailing clutches to permit the St. Roch to operate under sail with minimum propeller drag.

The St. Roch is a vessel of 323 tons displacement, 104 feet 3 inches overall, 95 feet between perpendiculars, 24 feet in molded beam, and with molded depths of 11 feet at the stern and 9 feet 6 inches at the bow. Under water, her whole construction is on the "saucer" plan, so that ice pressure will tend to lift the vessel rather than crush it.

Construction is of the heaviest. Her hull is practically solid timber, in thicknesses up to 21 inches. Her frames are 13 inches by 7 inches, of sawed Douglas fir. Her planking is 2¾-inch Douglas fir, covered with 1½-inch ironwood sheathing. Inside she has a 3½-inch ceiling. Her stem and stern are Australian gum wood. She has accommodations for 13 men and cargo space for about 100 tons.

Early on the evening of October 16, 1944, the Royal Canadian Mounted Police patrol vessel St. Roch crept in through the First Narrows into Burrard Inlet in a heavy fog and tied up at Vancouver, B.C., 86 days out of Halifax via the Northwest Passage.

The St. Roch thereby became the first craft ever to sail both ways across the top of the world, and the second ship in history to make the passage from east to west. She already held the honors for the west-to-east trip, having completed that voyage in 1942 after 28 months in passage. The St. Roch was already an Arctic veteran before she started her history-making trips.

In 1928, the year she was launched, she patrolled into Coronation Gulf. The following year she patrolled for 1900 miles along the northern islands over which Canada holds sovereignty. In fact, for twelve years the St. Roch, whose name stands for "the Saint of the Poor," sailed in and out of the western Arctic, but the most easterly point she touched was Nordenskiold in Queen Maud Gulf.

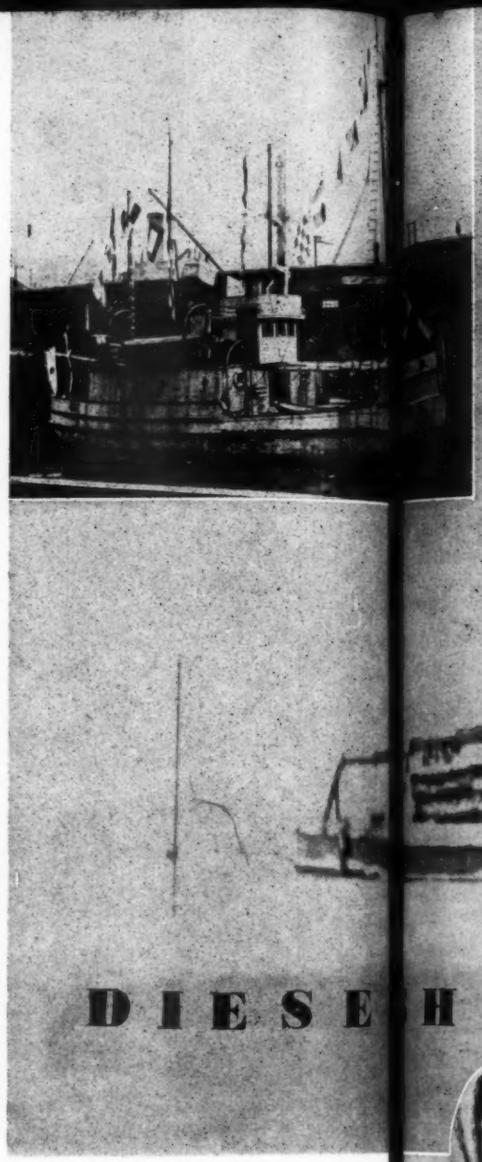
Throughout her entire career the St. Roch has been under command of Staff Sergeant Henry A. Larsen, R.C.M.P. Larsen, himself, is a notable figure. He was born in Norway, as was Roald Amundsen, and it is a coincidence that the two commanders who alone of all the world's great voyagers have traversed the Northwest Passage, should have come from towns so close together that Norwegians speak of them as a single community. Amundsen, who made the first traverse from east to west, was born at Sarpsbork; Larsen, who now has traversed it both ways, was born at Fredrikstad. Together, these towns number only a few hundred.

Tall and husky, every inch typical of his Viking forebears, Larsen was early attracted to the Arctic by the tales told of his illustrious neighbor. From these, he went on to read the accounts of other Arctic travelers.

"I read everything about explorations I could get my hands on when I was a kid," said the sergeant.

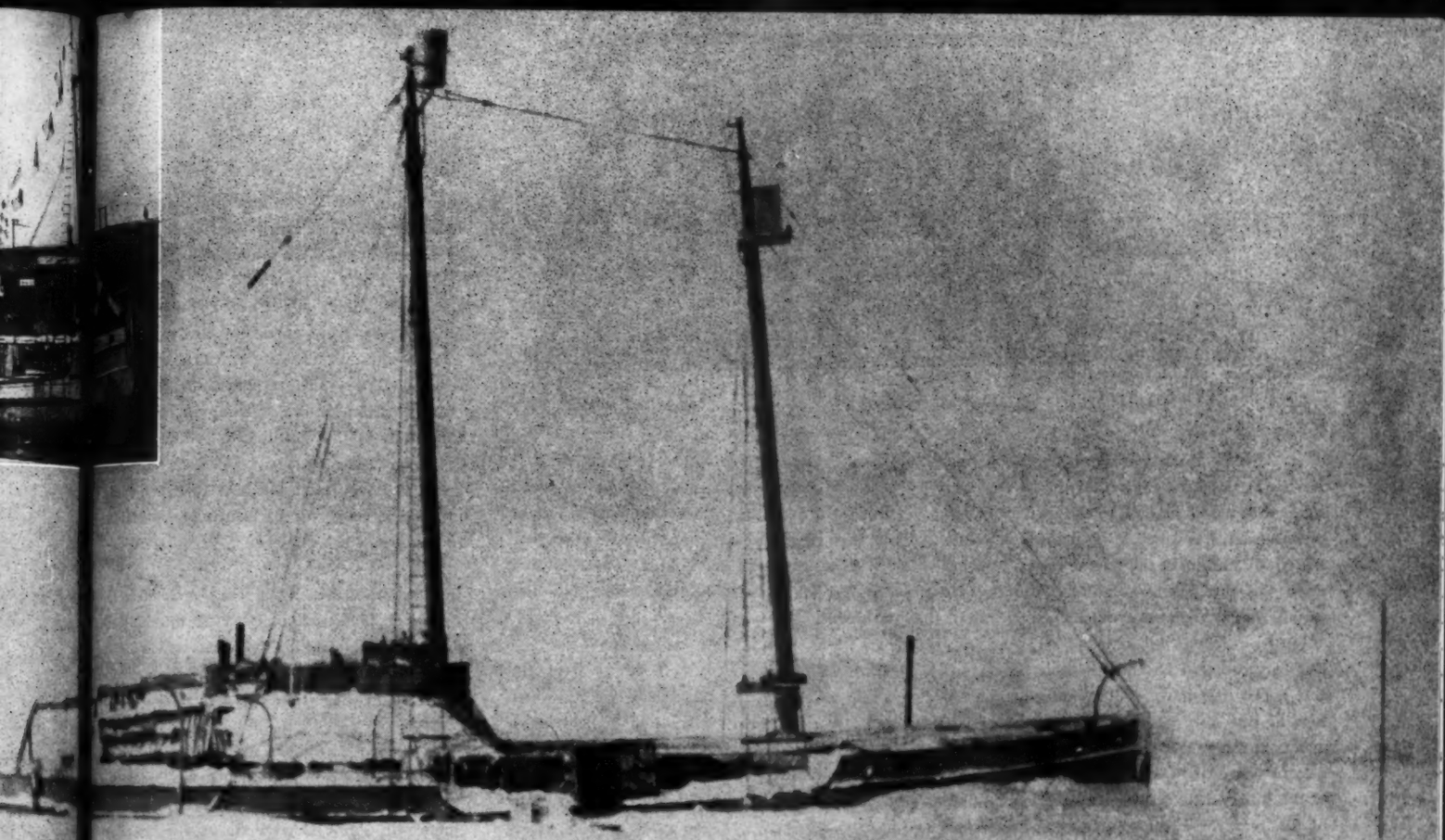
Larsen followed tradition and went to sea at twelve. "Everybody went to sea where I came from," said he, "so I guess it was only natural."

While he was still a young man, the sea brought him to Canada in search of new opportunities and in 1921 he met Amundsen in person, when their ships docked alongside one another in Seattle. The meeting settled his future. He would go into the Arctic himself. And go he did, as soon as he could, and spent four years as navigator of an Arctic trading vessel.

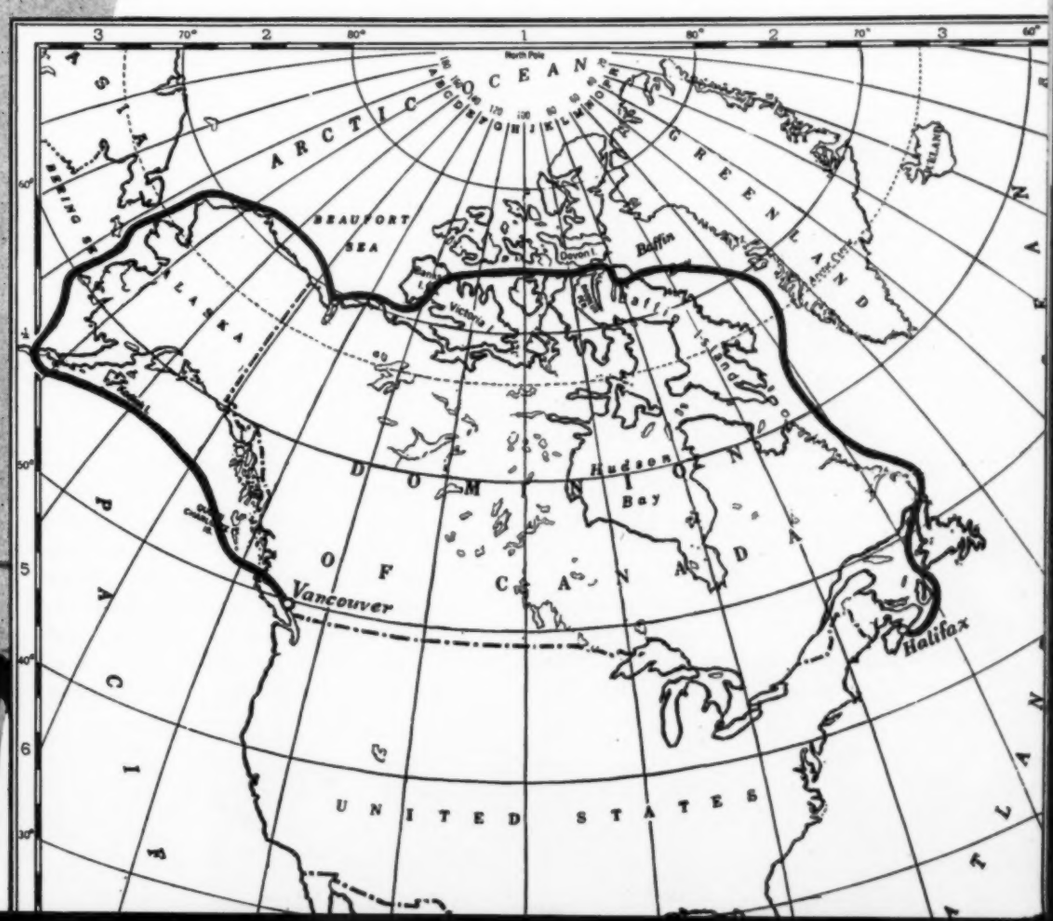


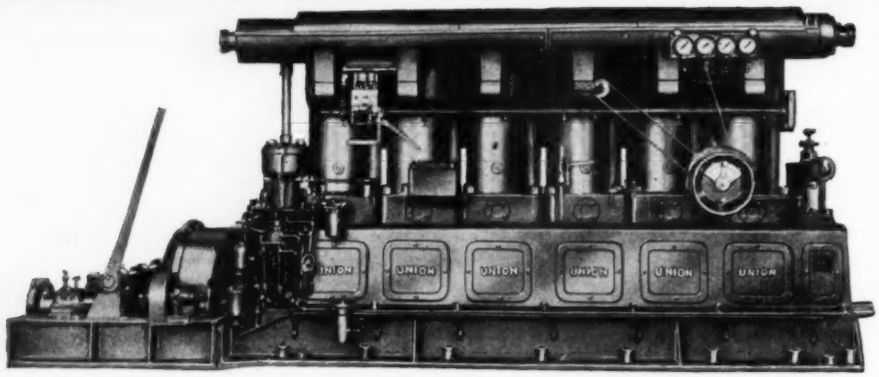
S/Sgt. Larsen, Master in his Arctic regalia on deck of the "St. Roch." Map, right shows one route followed by the "St. Roch."

* *From The Union Diesel Engine Company Bulletin No. 75.*



S E H I P "ST. ROCH" —





The 300 hp. Union Diesel with which the "St. Roch" was repowered after first voyage.

When the St. Roch was launched he joined the Royal Canadian Mounted Police and was assigned to her command. In the spring of 1940 he was ordered to take her right through to the east coast, "and that's the way we came," said he, when the voyage was completed twenty-eight months later. "It wasn't much."

But to those who have never seen the Arctic, and many who have, it was, indeed, "much". Behind the story of that heroic crossing are many hardships and many close brushes with death. More than once the eight-man crew of the sturdy little St. Roch nearly met the fate of Sir John Franklin and his men, who had perished while attempting a similar voyage in the Arctic nearly 100 years before. Often she was threatened by giant bergs. Repeatedly she was lifted bodily by the surging ice floes. Several times her people were ready to abandon the ship and take to the ice, but each time they were blessed with "luck."

One such experience was at Paisley Bay, near the magnetic north pole. Fighting their way through the ice only fifty yards from shore, they suddenly found themselves locked as the floes piled hard against their ship.

"We couldn't move an inch," said Larsen. "Our ship was dead. If we had got it anywhere else we would have been goners for sure. If that isn't luck, what can you call it? We easily got lines ashore and made fast to boulders. There we stayed for eleven months and a day, in the most barren part of the Arctic. There just isn't anything there. But the Eskimos came over from the other side of the island to visit and we went over there."

A little farther along they spent 24 days drifting up and down a stretch of only 45 miles off the Boothia Peninsula. A strong southerly gale finally split an ice barrier and let them through.

The St. Roch started her first epochal voyage from Vancouver in June and, going by way of Dutch Harbour, Herschel Island, Fort Brabant, a Hudson's Bay Post at Tuktuk on Bailie Island, Coppermine and Cambridge Bay, reached Walker Bay too late in the season to proceed any further, where she was locked in the ice. After breaking out in the spring of 1941 she put back to Tuktuk for additional supplies for herself and Cambridge Bay Detachment.

The St. Roch then proceeded to Franklin Strait, which Larsen described as the worst portion of their voyage, and in September of 1942 reached Baffin Bay. She then sailed down past Labrador to Newfoundland, called at Sydney, N. S., on October 7, and arrived at Halifax on October 9, after traveling 9,000 miles and traversing one of the most difficult regions in the Arctic.

There a group of R.C.M.P. officers, headed by Inspector W. Mortimer, the officer commanding "H" Division, greeted the vessel. Her entire company was presented with the Polar Medal.

On her trip, a census was taken of the Eskimos, a study was made of their language and much valuable weather information was obtained.

When she sailed, the St. Roch carried provisions for many months, as it was not known how long her company of eight men would have to remain in the Arctic. Except for her radio, the St. Roch was entirely out of touch with civilization during her 28 months in the Far North.

Only one man was lost on the voyage, Constable Albert J. Chartrand, who died of a heart attack and was buried at Paisley Bay on the Boothia Peninsula.

After the St. Roch's arrival at Halifax, inquiry was made as to whether a new, and larger, Union Diesel could be supplied for her. The United States Government released facilities for the production of such an engine for the Canadian Government and a 300 horsepower, six-cylinder Union Diesel was duly built and sent to Halifax for installation. It is an interesting commentary on the advance of Diesel engineering that this engine was placed in the same engine room which had been occupied previously by a Union Diesel of half its power.

During the time that the new engine was being built the St. Roch made an 8000-mile round trip in the eastern Arctic which took three months. They called at Labrador, Lake Harbour on Baffin Land, Southampton Island, Port Churchill, Eskimo Point, Chesterfield Inlet, up to Baker Lake and back to Lake Harbour, north to Pond Inlet, and back to Pangnirtung in Cumberland Sound, returning to Halifax in October, 1943.

Installation of this engine was completed in the spring of 1944, and on July 22 the St. Roch departed from Halifax on what was to be an even more sensational voyage through the Northwest Passage than her first.

This voyage occupied only 86 days. The St. Roch reached the mouth of the Mackenzie River in a matter of weeks only, and sailed thence to Point Barrow in only a few days.

The voyage was the farthest north yet made through the Northwest Passage, and followed a route which it is believed will make it possible for vessels to go through the Passage in a single season, without spending a winter in the ice. Deep water was found all the way. Previous voyages had been made through waters which were at times barely sufficient for such small vessels as the St. Roch.

The St. Roch's route on this second traverse of the Passage took her north past Labrador to Saxe-Coburg Island without event except that much ice was encountered. To avoid this she crossed over toward Greenland and followed as far as Disco Island, where she was hemmed in by ice two days, but managed to break free and went on to Scott Inlet, Baffin Land. Thence she went to Devon Island and there, at Erebus Bay, found pieces of wood from ships which had searched in vain for the ill-fated Franklin expedition nearly 100 years before.

"As far as Lancaster Inlet the ice is mainly in bergs, which are not too bad to navigate, for you can see around them," said Larsen. "From there on, however, it is one vast pack which never melts."

From Erebus Bay the St. Roch passed through Barrow Strait, passed Cape Providence and lay for four days in the fog in Melville Sound. She eventually picked up land at Richard Collin Inlet and completed her passage through

Melville Sound at Peal Point, Victoria Island. It was this portion of the voyage which revealed the existence of continuous deep water which would enable large vessels to go through the Passage. Larsen and his men were the first white persons ever to traverse this part of the world by ship.

From this point the St. Roch passed through Prince of Wales Strait, across Amundsen Gulf and the Beaufort Sea to Herschel Island, where she arrived September 17, only fifty-one days out from Halifax. Passing through a narrow, open channel between the shore and the main Arctic ice pack, the St. Roch reached Point Barrow October 2.

Navigation during this portion of the voyage was almost entirely by hand sounding line.

"We knew it was seven fathoms all the way to Barrow," said Captain Larsen. "Suddenly the leadsman sang out:

"'I can't find any bottom at twenty-five! The bottom has gone away!'

"So then I knew we were around.

"We sailed those Western Arctic waters entirely by old naval charts. Those old chartmakers were marvelous. How they did it, with the means at their disposal, I marvel."

From Point Barrow the St. Roch went south through the Bering Sea.

"At King Island we went in with the Blue Ensign flying," said Captain Larsen, "but we saw no sign of life. So I thought they might not know our flag and raised the Stars and Stripes. Then the whole population of about 180 Eskimos came out in canoes and boats. They thought our Blue Ensign was the Japanese flag!"

On her voyage the St. Roch had many adventures. Fog and ice conditions were very difficult especially in the first few weeks of the voyage.

Captain Larsen said that in eleven winters in the Arctic he had not seen such fogs. Her gyro compass broke down.

At Port Brabant, Tuktuk, where normal tides are only about two feet, the worst storm ever seen there raised the water level over 10 feet, almost washing away the Hudson's Bay Company post at that point, and putting the St. Roch into a very dangerous situation.

"We were in a bad spot, since we couldn't go out to sea and yet we couldn't go in to shore," said Larsen. "But we managed to weather it."

After this storm, Larsen decided the St. Roch had best get out of the Arctic before she was frozen in. Once the St. Roch ran on an ice floe which had been mistaken for a white horizon.

"Fortunately," said the captain, "it was a sloping shelf and we slid right back off again." On the shores of Delay Bay the St. Roch's people found a food cache left by Captain Henry Kellett in 1852, when he led one of the several expeditions sent in search of the lost Sir John Franklin and his men. "Bears had been having a picnic with the cairn and had broken it up." From Pond Inlet to Herschel Island the St. Roch had passengers—an Eskimo, his wife, his five children, their grandmother and 17 sled dogs. Larsen said the Indians were very happy during the whole trip in a little tent pitched on the vessel's deck. The dogs will be maintained at Herschel Island for the use of R.C.M.P. patrols who may require them.

According to both Captain Larsen and Chief Engineer Peters, both engines have performed with entire satisfaction. They are especially high in praise of her new, larger engine whose extra power was largely responsible for their being able to make the second traverse of the Passage in a single season.

Left: Chief Engineer Peters at the controls of the 300 hp. Union Diesel. Below: The Royal Canadian Mounted Police ship "St. Roch" at Halifax, N. S., July, 1944.

ANOTHER DIESEL "MUNY" CALLS ITS BONDS

By T. J. MALONE

ON August 1, this year, Lake Mills, Iowa paid a remaining $5,000 on the bond debt against its municipal Diesel-powered light plant. The payment wound up a fourteen-year retirement program in which earnings of the plant had wiped out a total bond obligation of $163,465 on the original plant and additions. A celebration seemed in order on the occasion of the plant's going into the clear and in recognition of so happy an outcome of cooperation between town officials and the community so the plant held an "open house" for young and old, and the last of the bonds were burned in fitting ceremony.

The plant investment, covering site, building, generating and other equipment, and distribution system, represents a value, without depreciation, of $184,366. Excess of investment over bond total means cost of additions cared for by plant earnings apart from the bond account.

Lake Mills, a town of some 1,800 people, in Winnebago County, not far from the Minnesota line, went in for a municipal electric plant in 1931, after experience with high-line service and, before that, with a private steam plant. It installed at the start a 210 and a 280 hp. Diesel engine, supplied by Fairbanks-Morse with alternators and auxiliary equipment. Six years later it added a 450 hp. Diesel and in 1941 "another of the same," both Fairbanks-Morse.

About two years ago it had the 280 hp. engine rebuilt into a 300 hp., thus giving the four engines a total horsepower of 1410. The alternators have a combined capacity of 935 kilowatts against which the load last year ran a 900 peak. More about that peak later.

In rebuilding, the 280 hp. Diesel became a new engine, from the crankshaft on up. New main bearings also were installed. The done-over engine responded with increased efficiency. A gallon of fuel oil produced 12.3 kilowatt hours of energy as compared with 10 before. Horsepower hours per gallon of lubricating oil went up from 1,500 to 2,800. Maintenance and repairs of all four engines in the last three years, including materials and labor, cost an average of 80 cents a horsepower yearly.

How the plant has been functioning through the years is suggested by the following table for certain key years. The plant operated on a calendar year basis up to 1943 but went on the fiscal-year basis April 1 of that year—April to March inclusive. Here is the table, for the first full year of operation, the next full year after installation of the first 450 hp. engine, the next full year after installation of the second 450 hp. engine (all calendar years) and the latest fiscal year:

Year	KWH volume sold	KWH per gallon of fuel oil	Av. KWH cost del'd to consumer	Av. KWH sale price, excluding REA
1932	255,845	10.80	$	...
1938	546,875	11.06	.012	.042
1942	1,858,078	12.00	.011	.041
1944-1945	2,421,656	12.20	.0117	.041

Cost-to-consumer prices take into consideration generation, distribution and administration costs, as well as interest and payoffs. Sale-price figures exclude service to an REA cooperative and apply only to consumers within the town.

The plant served this cooperative for five years, with a high load factor the last four—up into the seventies —, at times reaching that 900 kw. peak. Confronted with the necessity of adding to the generating equipment or ending service to the cooperative, the plant authorities decided on the latter course. They withdrew service by degrees, furnishing only two-fifths of the load between December 9, 1944, and April 9, 1945, and discontinuing service altogether on the latter date. That is, they refused to renew the contract. In 1943-1944, the kwh. volume sold was 2,749,067. The decrease in the next year's volume reflects the restricted service to the cooperative.

"With the REA customer out of the picture, our peak will be about 400 kw.," said L. L. Waggoner, the plant manager, "giving us about 100 per cent standby. In recent years we have been running nearly to capacity and with no standby. By confining our service to the town of Lake Mills, we recognize that this, after all, is our main job."

The Lake Mills electric plant has contributed some free service in the public interest. The mayor and members of the town council, who direct the plant, and the water department along with it, have held that debt retirement was the main objective, along with good service and fair rates to consumers. To that end of debt clearance they have been zealous to take all discounts and pay off all callable bonds before maturities. Still there have been some minor contributions of service.

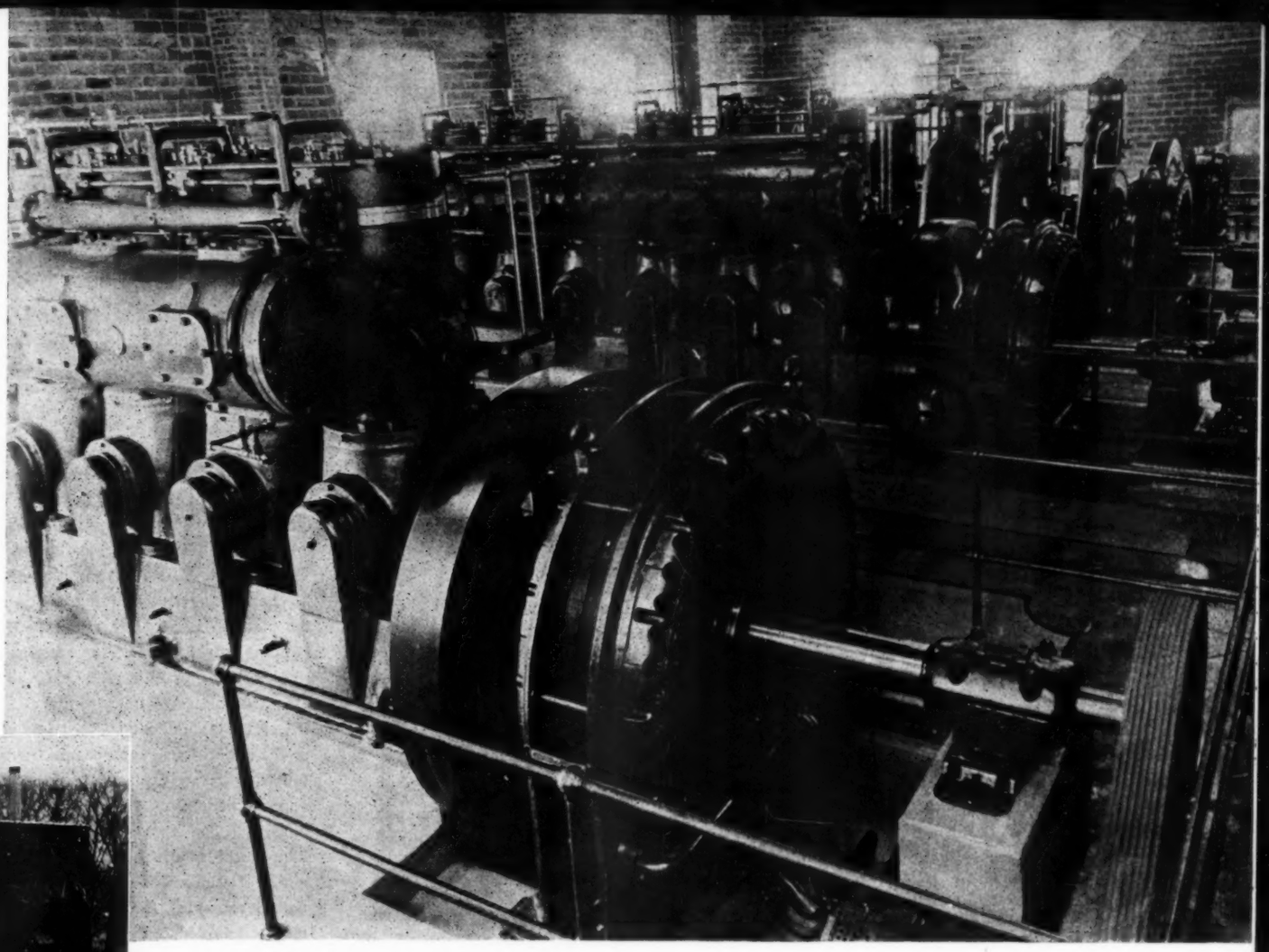
All city departments pay for service like private consumers. But football—that's another thing. The school athletic field is floodlighted for night play, with no charge for lighting. So with city park lighting, and all special Christmas installation and lighting up to recent years. Rates have been reduced three times since the initial schedule obtained. The starting rate has gone down from 14 cents under the old high-line structure to 7 cents now, the town's main rate. This 7 cents compares with 12 cents in the town's own first schedule.

Exterior view of the Lake Mills, Iowa, municipal power plant.

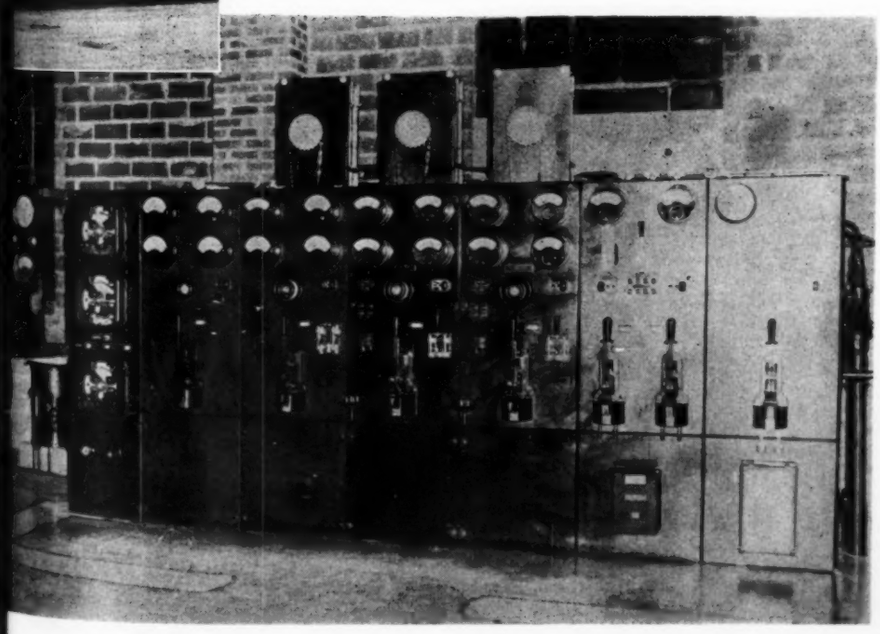
Commercial and lighting rates, beginning with 1941, have been: first 50 kilowatt hours, 7 cents; next 250 kwh., 5 cents; balance, 4 cents. Before the reduction, 1941, they were: first 50 kwh., 8 cents; balance, 5 cents. A residence optional rate, on yearly basis only, is: first 40 kwh per month, $3.00; next 20, 3 cents; balance, 2 cents. These prices replaced: first 40 kwh., $4.00; balance, 3 cents.

Power rates are: first kwh. per month, 6.5 cents; next 200, 6 cents, next 700, 4 cents, balance, 3 cents. These compare with rates before 1941 of: first 100 kwh., 7 cents; next 200, 6 cents; balance, 4 cents.

The principal industries using power are a canning factory (corn, peas, beans, tomatoes), two attrition mills, a creamery, a hatchery and an oil company loading station which has its



Main units are three F-M Diesel-generators of 450 hp., 300 hp., and 210 hp.

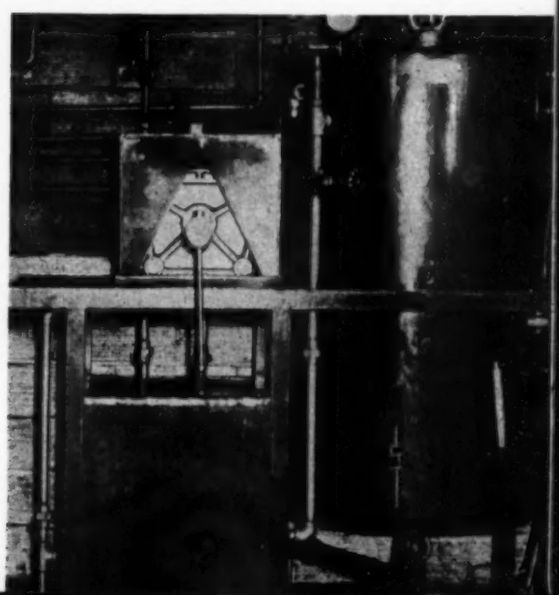


The six-panel switchboard is fitted with Roller-Smith and General Electric instruments and Allis-Chalmers voltage regulators.

main office in Lake Mills.

Officials directing the light and water plant are Karl O. Hylbak, the mayor, and members of the council: W. H. Bakken, Julius Holstad, Carl Lande, G. W. Stamp and H. E. Twito. Mr. Waggoner has been manager from the start. Three operators who served apprenticeships under him in Lake Mills have since become managers of other municipal Diesel electric plants. Lake Mills, founded in the early 1860's, occupies a site part of which was once covered by a lake. On the lake shore was a saw and grist mill. Hence "the lake mills."

Renuoil lube oil purifier.



THE DIESEL AND THE GAS TURBINE COMPARED

By R. TOM SAWYER*

I HAVE frequently been asked the question, "Will the gas turbine supersede the Diesel engine?" My answer to that is that the wrong word has been used. The gas turbine will "supplement" the Diesel engine. The two will go hand in hand. The gas turbine is here to stay and because the gas turbine is here, it means that the Diesel engine will have a greater future than it ever had without the gas turbine.

The Diesel and the gas turbine have one thing in common; they both have a combustion chamber and in that combustion chamber they both inject a fuel into pure air. The primary difference is that the Diesel engine has an intermittent burning while the gas turbine used as a prime mover has continuous burning in this combustion chamber. In the case of the Diesel, the compressed hot air acts against a piston while with the gas turbine, the compressed hot air acts against the turbine blades.

Turbocharging 4-Cycle Engine

That engine, whether it be a Diesel or gasoline engine, which is not turbocharged, is not being pushed to its limit. Without the gas turbine, we would not have turbocharging. By the use of turbocharging, the Diesel engine can produce more power per pound weight and be equally as reliable as heavy duty engines. That is the reason the statement can be made that the Diesel has a far greater future with the gas turbine here than without the gas turbine.

The Cooper Bessemer Co. was the first to use a gas turbine supercharger in this country on a Diesel. The American Locomotive Co. was the first to manufacture gas turbines in this country for Diesel engines, and to use them on a large scale. The American Locomotive Co. has been using and building gas turbines for the past ten years. The Elliott Co. has been building gas turbines for supercharger use since 1940. The Elliott Co. has built up an excellent business of this type and a great many Diesel engine builders have taken advantage of the Elliott-Buchi turbocharger system. The following is an explanation as to how this system functions:

The Buchi system is used on four-cycle engines, of which that shown in Figure 3 is a typical example. Each stroke of the engine may be followed in Figure 3:

1. Note the large arrow at the crankshaft. At the start of this arrow, the exhaust valve closes; the piston continues to move down and admits a charge of plain air. The air is blown in under a pressure of from 3 to 5 pounds per square inch. As the shaft revolves to the head of the arrow, the piston comes to the bottom of its stroke and the cylinder has been completely filled with fresh air already under a slight pressure.

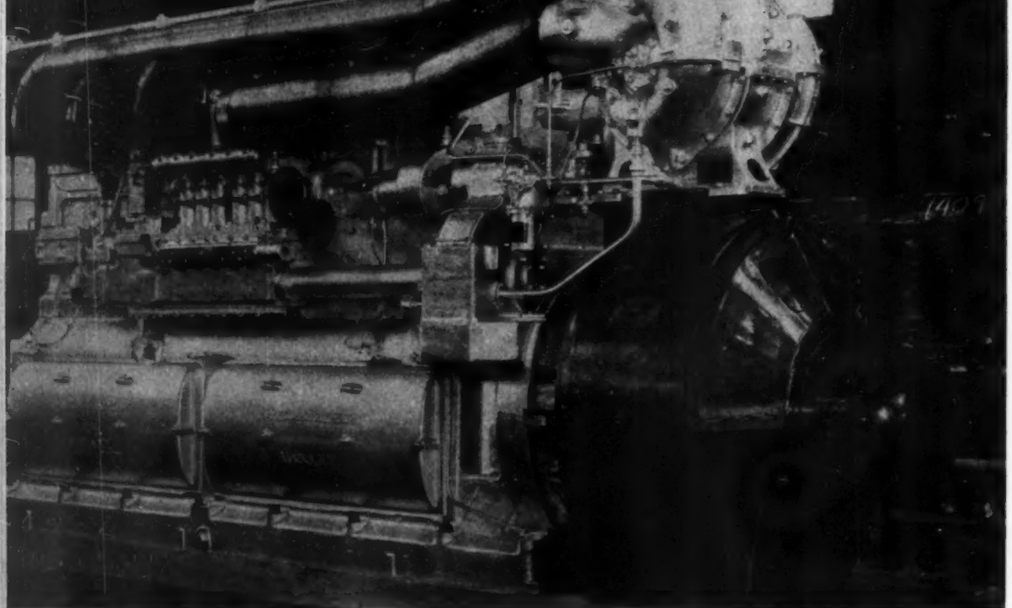
2. The intake valve closes at the beginning of this arrow. The piston continues upward, compressing the enclosed fresh air.

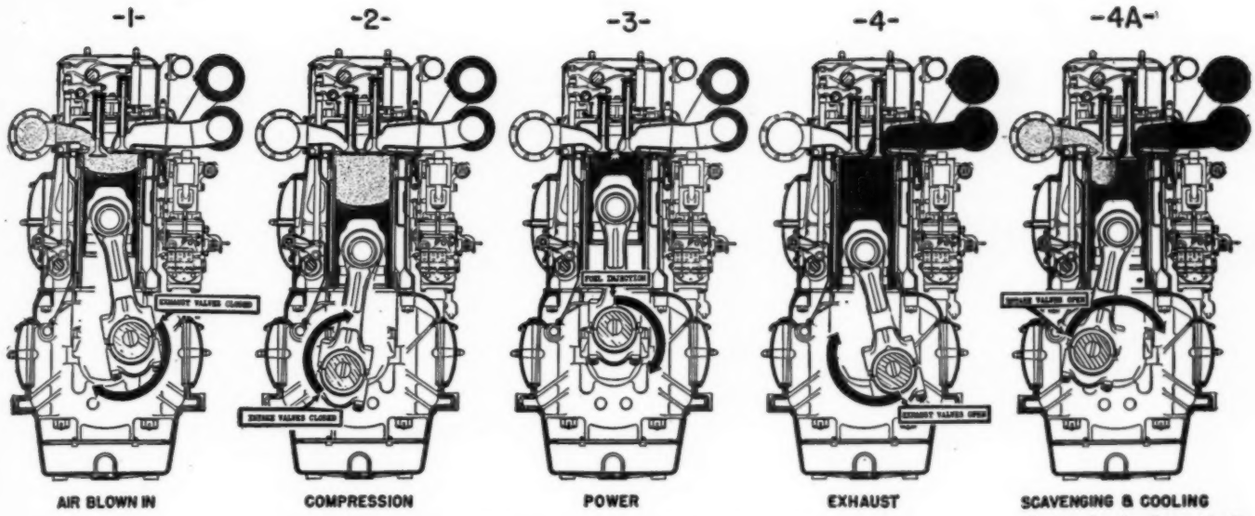
3. With the piston at the top, compression has been completed. At that moment the injection nozzle opens, atomizing the fuel oil into the highly compressed hot air. The mixing of oil and extremely hot air causes an explosion, or, rather, a very rapid burning, generating pressure which drives the piston downward.

4. At the beginning of this arrow, the exhaust valve opens, releasing the confined exhaust gases, which are then pushed out by the rising piston. (This exhaust goes out the lower pipe. To prevent interference, the next cylinder to

** Engineer, Diesel Equipment, American Locomotive Company, author of "The Modern Gas Turbine," published by Prentice Hall. Illustrations taken from this book.*

Fig. 4. Alco Turbocharged 1000 hp. Diesel Engine. (Exhaust side looking at generator end)





Courtesy American Locomotive Co.

Fig. 3. Four-Cycle Turbocharged Diesel According to the Buchi System.

function will use the top exhaust pipe.) Both pipes lead directly to the turbine, as is shown in Figure 4. These gases, at a pressure of from 2 to 8 pounds and a temperature of 1000° F. are used to drive the turbine.

If the engine were not supercharged, the cycle would now recommence with stroke 1 upon completion of stroke 4: the exhaust valve would close and the intake valve would open. However, in this supercharged engine, the next step is 4A, where both the inlet and exhaust valves are held open for a long period in order to completely scavenge the cylinder. The purpose of this scavenging is to prevent contaminating the incoming air with the large amount of hot, burnt gases which would otherwise remain in the cylinder.

At the beginning of the arrow in position 4A, the intake valve opens and allows fresh air to be blown in under pressure to force out most of the impure exhaust gases. Both valves are simultaneously open for from 125° to 150°, allowing ample time for the intake air to completely scavenge and clean out the combustion chamber, allowing only fresh, cool air to remain in the cylinder. After this complete scavenging, the exhaust valve closes and the piston descends on stroke number (1).

By scavenging and supercharging the Diesel engine in this way, the exhaust gas turbine is responsible for approximately a 50 per cent increase in power.

Turbocharging 2-Cycle Engine

Two-cycle engines may also be turbocharged. The 2-cycle engine may have a piston blower or rotary blower geared to it. In any case, it must have a blower driven by the engine shaft. Figure 9 is a typical method of supercharging a 2-cycle engine according to the Sulzer Brothers system. This development which took place in 1940, consisted of an opposed-piston engine using two gear-joined crankshafts and a gear-driven axial blower to supercharge the cylinders. The exhaust gases were used to drive an exhaust gas turbine geared to one of the crankshafts.

The next step was to use all the engine power to drive the axial blower and to let the exhaust gas turbine supply the entire external load. The turbine is not geared to the engine. This type of unit is shown in Figure 10.

It is of particular interest to note that Dr. A. Stodola, of Zurich, had suggested the arrangements shown in Figures 9 and 10 some eight to ten years previously as a result of his theoretical studies.

When the exhaust gas turbine is the main source of power, it is desirable that the entire unit should operate at a constant rather than a variable load. Consequently, it is well suited to marine and certain stationary uses, but not to locomotives or other vehicles. For variable loads, it is preferable to have the exhaust gas turbine geared to the engine if only one engine-compressor unit is used. If several engine-compressor units are used, all feeding into the same exhaust gas turbine, the power can be changed to suit the load by shutting down one or more engine-compressor units.

Comparing Figure 10 with a constant-pressure gas turbine set, it will be seen that the Diesel engine takes the place of the firebox, and that no heat exchanger is required, other than a radiator to cool the engine. This arrangement is superior to the constant-pressure gas turbine in that it may realize 35 per cent thermal efficiency and yet have an exhaust temperature of only 1000° F., entering the turbine as a result of the heat abstracted within the engine cylinders.

To secure the advantages of this system at partial loads, the turbine must be mechanically connected to the engine, as in Figure 9.

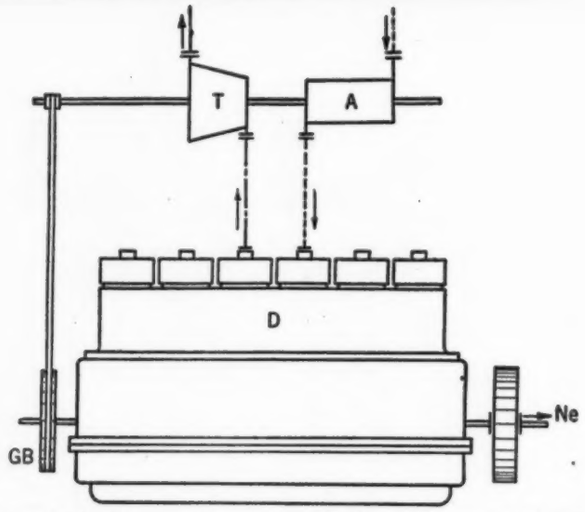
By using a large axial blower, a high degree of supercharging may be obtained for both partial- and full-load condition. In this way the high thermal efficiency credited to Figure 10, that is, 35 per cent, can be approximately realized at three-fourths load as well as at full load. In fact, the combination will have a comparatively high thermal efficiency throughout the entire range.

Free Piston Engine

Figure 11 illustrates another way of using the engine solely to furnish exhaust gases to the turbine, while the latter drives an electric generator. The free-piston Pescara engine, not having a crankshaft, cannot mechanically drive any load. The explosion chamber is located between the two pistons; the outer ends of the pistons are used as air compressors to produce the air for scavenging and charging the combustion chamber.

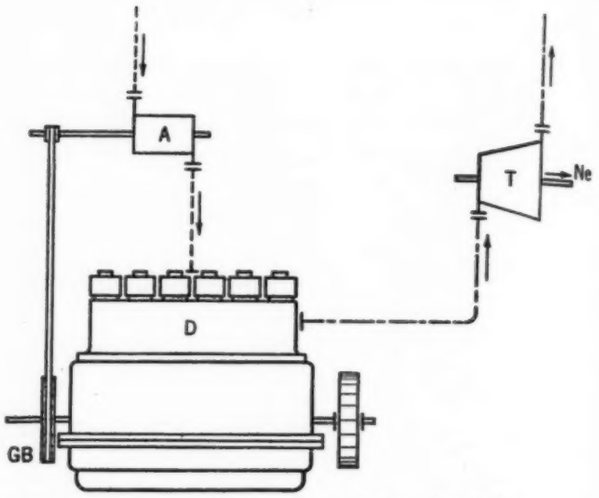
The system of Figure 11 is similar to that of Figure 10 in that the gas turbine supplies the whole external load, and in that neither system can operate at light loads. However, both are efficient at full load.

The Diesel engine in Figure 11 resembles the Michell crankless type of engine. Both are well suited for compressing air, each having an air compressor at one end of the piston and an explosion chamber at the other end.



D—Two-Stroke Diesel Engine.
T—Exhaust Gas Turbine.
A—Axial Compressor Coupled to Exhaust Gas Turbine.
GB—Gear Between Diesel Engine and Exhaust Gas Turbine.
Ne—Effective Output at the Shaft.

Fig. 9. Highly Supercharged Two-Stroke Diesel Engine with Mechanically Coupled Rotary Compressor and Mechanical Transmission Between Exhaust Gas Turbine and Diesel Engine. The exhaust gas turbine is coupled by gearing.



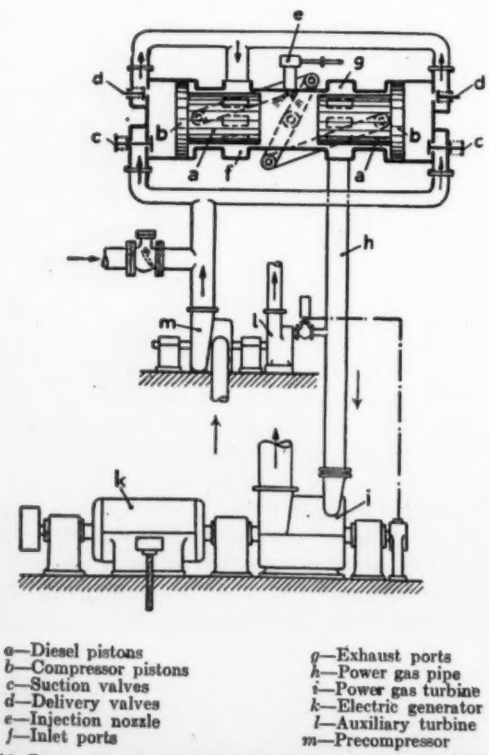
D—Two-Stroke Diesel Engine.
A—Axial Compressor.
GB—Gear Between Diesel Engine and Axial Compressor.
T—Exhaust Gas Turbine.
Ne—Effective Output at the Shaft.
- - - - - - - - - - Scavenging Air.
——————— Power Gas.

Fig. 10. Power Gas Process, with a Crank Diesel Engine and an Axial Compressor Driven by the Diesel Engine.

Combustion Gas Turbine Efficiencies for the Open Cycle

From Figure 2, we find that the thermal efficiency of the simplest type of gas turbine unit, using a regenerator, is equal to that of a Diesel providing a temperature of 1500° F. is used. At the present time, temperatures of between 1200° and 1300° are possible for reliable operation, but we can rest assured that considerable effort is being made to obtain materials suitable for 1500°. For example, in Figure 2, we select a pressure ratio that gives us the best results, which in this case, is approximately 4 to 1. At 1500° F. with a regenerator having an effective area of .75, we have close to 35% thermal efficiency. At 1200° F. without a regenerator, we have a thermal efficiency of approximately 19%. If a regenerator is used with 1200° F., we have an efficiency of approximately 28%. It should be kept in mind that these efficiencies are based upon a unit of about 2500 hp. or larger, these are not based upon a small unit. We, therefore, say that the gas turbine, to be as efficient as the Diesel, must first be of a large size and second, must use a temperature of at least 1500° F.

If we wish to go into additional units on the gas turbine power plant, that is, by using two turbines and two compressors with intercoolers and reheaters, we should refer to Figure 8. In this case, with a temperature of 1200° and a regenerator with an effective surface of .75, we have a thermal efficiency of 32½% with a pressure ratio of 6 to 1. With a temperature of 1500° it is of interest to note that the thermal efficiency may exceed that of the Diesel engine. There are, of course, many combinations of arrangements between that of Figure 2 and Figure 8.



a—Diesel pistons
b—Compressor pistons
c—Suction valves
d—Delivery valves
e—Injection nozzle
f—Inlet ports
g—Exhaust ports
h—Power gas pipe
i—Power gas turbine
k—Electric generator
l—Auxiliary turbine
m—Precompressor

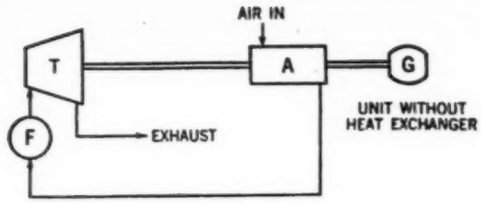
Fig. 11. Power Gas Process with Free-Piston Power Gas Generator.

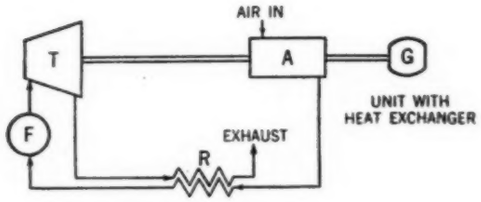
Gas Turbine Operated in the Closed Cycle

The principal objection to the gas turbine operated on the closed cycle is that after the exhaust comes out of the regenerator, it must be cooled by a large quantity of cold water in order to have the air at a suitable temperature to enter the compressor again. The conventional closed circuit diagram is shown in Figure 18. According to tests made by Escher Wyss last December, on a 2-shaft arrangement similar to Figure 8, but of the closed system, a thermal efficiency of 31.6% was obtained. This was based upon a unit having a net output of 2000 kw. It should be particularly noted that the test was made in December, so that all weather conditions were in favor of the gas turbine. Even so, the Escher Wyss organization must be highly congratulated for obtaining such a high thermal efficiency on their first experimental unit. The closed system has the advantage of having unusually small turbines and compressors due to the fact that the air handled through the system is at a much higher pressure than that of the open system. On the other hand, to obtain such a high efficiency, it is necessary to have an unusually large hot air boiler, regenerator and intercoolers, which take up a considerable amount of floor space. In other words, the closed system is primarily suited for competition with the central station steam plant while it cannot be used to advantage on any moving vehicles.

The greatest promise for the gas turbine of the future in central station work is on the semi-closed system wherein a closed system is supercharged in some manner. The Westinghouse Electric Corporation is one of those organizations which has proposed a semi-closed system. Generally speaking, even the semi-closed system requires a considerable amount of cold water for cooling purposes and therefore, does not lend itself to advantage on any type of vehicle.

If one makes a study of the gas turbine situation they will find that there are a great many combinations. About two years ago, I drew up "57 different varieties" and now come to the conclusion that there is almost an unlimited number of combinations, many of which would be very successful. The gas turbine is not only used separately as a prime mover, but can be combined with the Diesel engine as a supercharger or combined with a steam plant as a supercharger, similar to the velox boiler. Space will not permit in this particular article, to





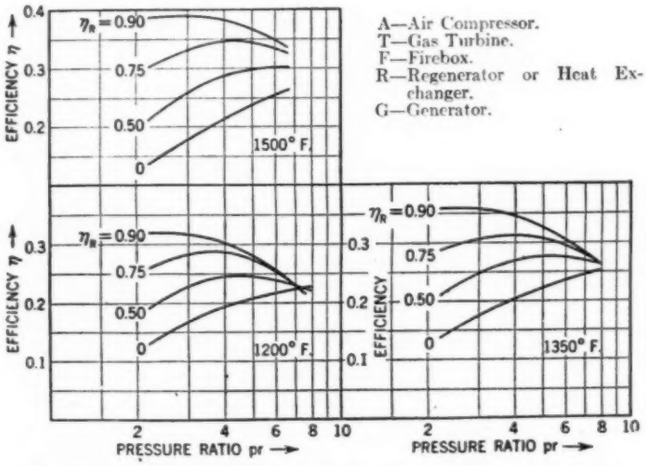
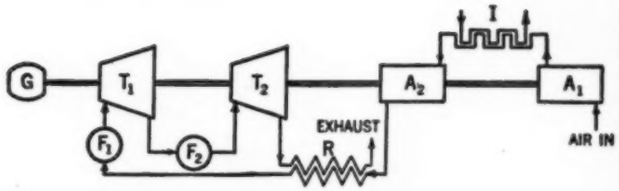


Fig. 2. Efficiencies at Various Temperatures for Cycle 1-0-η_R (*1*—firebox or combustion chamber, *0*—intercoolers, various regenerator efficiencies as shown, denoted by η_R).



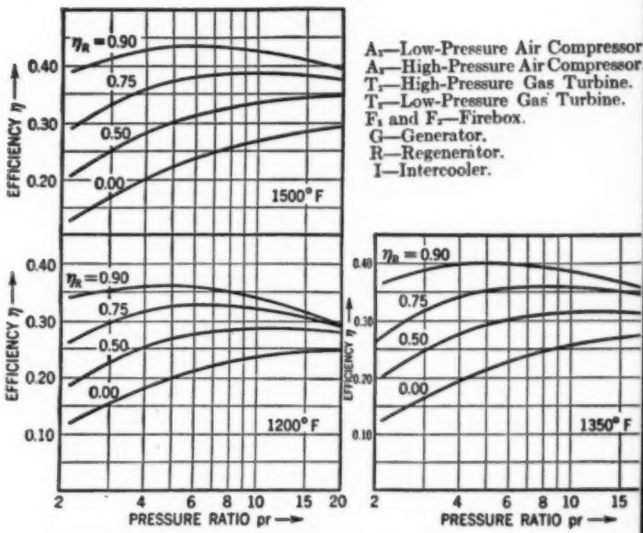


Fig. 8. Efficiency at Various Temperatures for Cycle 2-1-η_R, Showing Effect of Turbine Compounding with Intercooler and Compounding of Compressors.

describe the velox boiler or the many ways in which the gas turbine can be used with steam turbine plants.

Service

Let us now analyze the Diesel and gas turbine and see how they fit into each class of service:

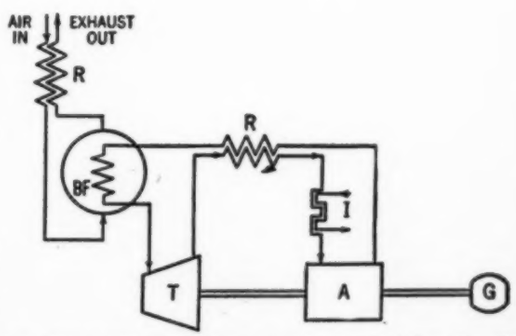
Aviation

Last December at the A.S.M.E. meeting in New York, Geoffrey Smith, author of well known Diesel books in the British Empire made a statement to the effect that the gas turbine would wipe the Diesel engine out of the Aviation picture. When the Army P80, Lockheed, Shooting Star fighter plane, took only one hour to go from Dayton to LaGuardia field, 544 miles, we can certainly say that Geoffrey Smith was right. The Aviation industry is seeking speed together with economy and a fuel that is not explosive. The gas turbine has given this answer because no other plane can make such speed regardless as to the amount of fuel used. The best Diesel engine ever built for aviation use could not come down to the weight of 1 lb. per horsepower while the gasoline high octane engine will. The gasoline engine will no doubt continue to be the most economical means of traveling by air providing the speed is held below 350 mph.

Figure 16 shows that a 10,000 lb. jet plane operating at 10,000 feet altitude will travel 525 mph. This is very close to the actual performance of the P80. All of us have heard a great deal about jet propulsion. However only a few of us realize that if a propeller is attached to this gas turbine jet unit, it will have a much more economical speed range than the jet unit without the propeller. Figure 16 shows that this turbine propeller unit will have a maximum speed of 450 mph. for the same 10,000 lb. plane. Figure 15 shows how simple the construction is of such a turbine propeller unit. To me, it appears that this turbine propeller unit is most suitable for heavy transport planes, particularly if 4 units, each 5000 hp. were used on one large plane. I should add, however, that for the plane that the average man will buy, the reciprocating gasoline engine, will be unquestionably the most economical.

Stationary Service

Stationary service is practically the opposite of aviation. Weight is of minor importance, long life and economy are primary. The gasoline engine is used very little in stationary service. The Diesel engine is the prime mover in stationary service up to 1000 hp. Above 1000 hp., the steam turbine and the Diesel engine are both used. Above 2000 to 3000 hp. the steam turbine is generally used. The gas turbine will supersede the steam turbine and supplement the Diesel in the range of power from 2000 up to let us say 10,000 hp. This still means that the large central station will continue to use, for many years, steam power plants. A gas turbine central station plant having an output of 4000 net kw., was placed in service in 1940 in the city of Neuchatel, Switzerland. This unit was built by Brown Boveri & Company. This particular plant has a thermal efficiency of 18% and does not use a regenerator. Such a plant is an excellent stand-by for peak load operation which does not require a high thermal efficiency unit.



BF—Boiler Firebox with Dry Tubes to Heat the Hot Air or Gas Circulated Through It.
A—Air Compressor.
T—Gas Turbine.
R—Regenerator.
I—Intercooler used as Precooler.
G—Generator.

Fig. 18. The Conventional Closed Circuit Diagram.

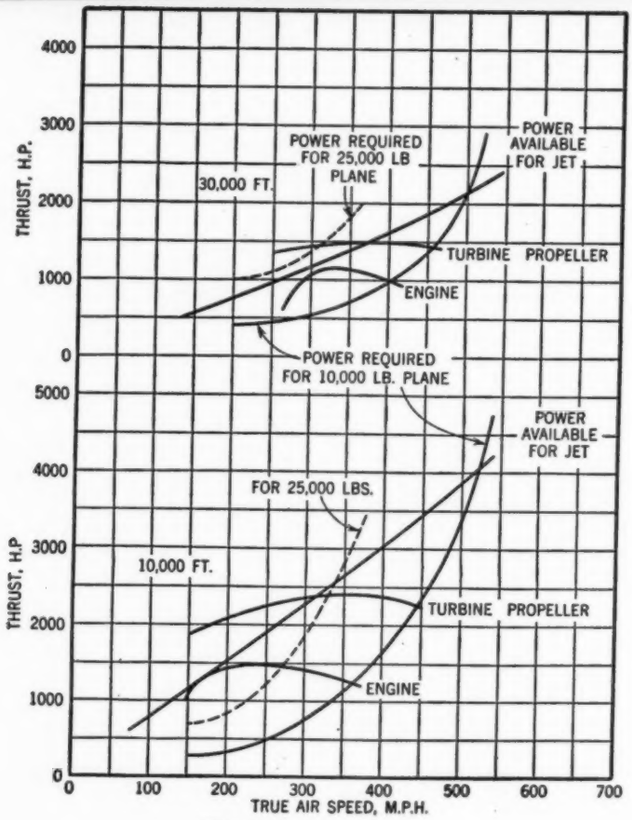
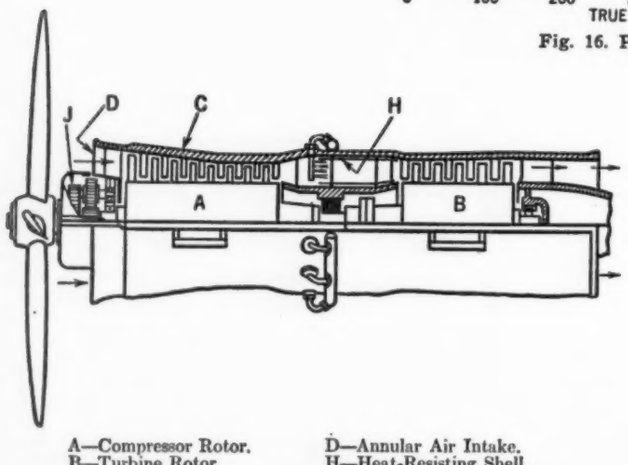
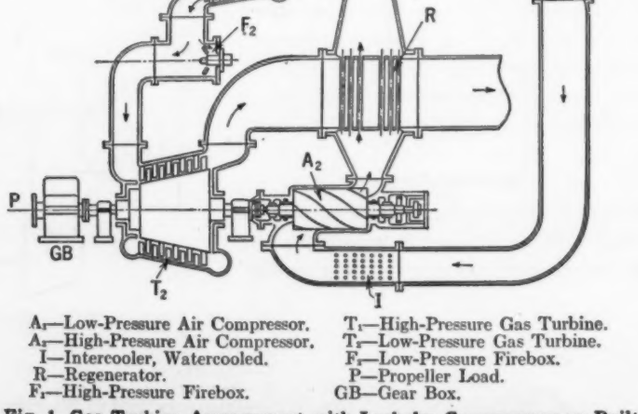


Fig. 16. Power Curves.



A—Compressor Rotor.
B—Turbine Rotor.
C—Casing.
D—Annular Air Intake.
H—Heat-Resisting Shell.
J—Airscrew Reduction Gear.

Fig. 15. Brown Boveri Gas Turbine for Airscrew and Jet Propulsion. This illustration is taken by permission from the book *Gas Turbines and Jet Propulsion*, by G. Geoffrey Smith.



A_1—Low-Pressure Air Compressor.
A_2—High-Pressure Air Compressor.
I—Intercooler, Watercooled.
R—Regenerator.
F_1—High-Pressure Firebox.
T_1—High-Pressure Gas Turbine.
T_2—Low-Pressure Gas Turbine.
F_2—Low-Pressure Firebox.
P—Propeller Load.
GB—Gear Box.

Fig. 1. Gas Turbine Arrangement with Lysholm Compressors as Built by the Elliott Company for Marine Service.

Industrial

There are a great many uses for the gas turbine in industry. One of the finest examples is the gas turbine used in the Houdry oil refinery process. Last June, in Chicago, A. E. Pew, Jr., Vice President of the Sun Oil Company, gave a paper on the subject of maintenance. It was very surprising to note that their six units at Marcus Hook, which included the first to be operated in this country, had an out-of-service record of only 2% of the total time since the turbines were placed in service up to May 31, 1945. Six turbines in a steam power plant could not be expected to do better than this, and we may also state that this would be an excellent record for a Diesel plant. Each of these gas turbines had a gross output of approximately 6000 hp.

Another industrial use is having a gas turbine drive an unusually large compressor not only for the purpose of delivering air to itself, but excess air for blast furnace use in steel mills. This opens up a large field for gas turbines and will, no doubt, be adopted as soon as the war will allow it.

Other industrial uses include furnishing excess air at various pressures and temperatures and at the same time use the exhaust to operate a waste heat boiler. For such plants, thermal efficiency is up to 60 to 70%, which can be obtained, taking all items into account.

Marine

Figure 1 shows the gas turbine unit recently built and tested for marine service by the Elliott Company. This unit obtained a thermal efficiency of approximately 29% being the highest efficiency of any open cycle gas turbine yet built. This is also the first gas turbine unit to be built strictly for marine purpose. This efficiency compares with 35% for the Diesel and approximately 26% for a steam turbine unit of the same size, that is, approximately 2500 hp. net.

One should particularly note in Figure 1 that this unit is of the 2-shaft arrangement; one turbine used to drive the low pressure air compressor of the Lysholm positive displacement type. The other turbine is used to drive not only the high pressure compressor but also the propeller shaft through a suitable gearing. This unit uses both an intercooler cooled with cold water and a regenerator heated by the exhaust gases. It should also be noted that this unit is not reversible so it is necessary to use a reversing propeller which, of course, makes a very efficient drive. The advantage of the 2-shaft

arrangement is to allow the turbine driving the propeller to operate at a constant speed and the other shaft to operate at a variable speed, in proportion to the desired load.

It should be mentioned that Elliott is not the only company developing gas turbines for Marine use, but they are certainly the first company to produce a successful unit. The Diesel engine has an excellent place in the marine field. The war has placed engines up to 2000 hp. in a great many types of ships. It does appear, however, that Diesel engines above 2000 hp. are the exception, rather than the rule. The gas turbine in Marine service will start with 2500 hp. The next step will be 3000 hp. and higher. I wish to emphasize again that the gas turbine will supplement the Diesel and not supersede it in the marine field.

Locomotives

Practically every successful large Diesel engine in railroad service is supercharged. The small engines used in railroad service are beginning to adopt blowers. A cheap blower is the belt driven positive displacement type used on small locomotive engines. A big majority of 2-cycle engines in locomotive service have a gear driven positive displacement blower. By far, the majority of large 4-cycle engines in railroad service are blown with the Buchi type turbocharger. Railroad service, like aviation, needs an engine which is light in weight. However, this engine must be rugged to sustain the many shocks encountered when operating on the rails. The engine with the turbocharger produces 50% more power and costs no more to maintain than the engine without the turbocharger. The cost of maintaining the turbocharger is small. As for example, it has only two bearings and these have a two year life. Prior to the war, the large European Diesels for road locomotive service, were of the 4-cycle turbocharged type.

The first gas turbine locomotive was built by Brown Boveri and Company, and placed in service in 1941 on the Swiss Federal Railways. This locomotive had a net rating of 2200 hp. and a thermal efficiency of almost 18%. This locomotive has one turbine, one compressor, one firebox and one regenerator. The unit is geared down to a direct current generator. This unit has, according to its manufacturer, given excellent results, not missing a day in service for which it was scheduled. This is certainly an excellent record for the first unit.

There are various gas turbine manufacturers in this country who are interested in the locomotive field. It should be emphasized that according to Brown Boveri & Company, the gas turbine locomotive can be built most economically when built in sizes above 2000 hp. This again leaves room for the Diesel up to 2000 hp. and at the present time we do not have a Diesel engine in railway service in this country of more than 2000 hp.

Coal Fired Gas Turbines

Figure 17 shows a Brown Boveri experimental pulverized fuel fired gas turbine unit. There is no question but the largest quantity of known fuel in the world is coal. It is also of interest to note there are more known oil reserves in the world today than ever before; that this condition increases, rather than decreases. Whether oil or coal is to be used, the gas turbine must be capable of using either fuel. I have made no mention of natural gas for a fuel. This, of course, is very suitable being cleaner than either oil or coal.

Dr. J. I. Yellott, Director of Research, Locomotive Development Committee, has been handed one of the toughest jobs any research man could be given. That is, the burning of coal in a gas turbine locomotive. He not only has to burn coal but within a limited space and weight. This organization is sponsored by six railroad, three coal companies and the Bituminous Coal Research organization. It is a relatively simple matter to burn coal in the closed cycle principal, but this, of course, cannot be used on a locomotive due to the enormous quantity of cooling water required. Therefore, Dr. Yellott must use the open cycle system or a semi-open cycle system.

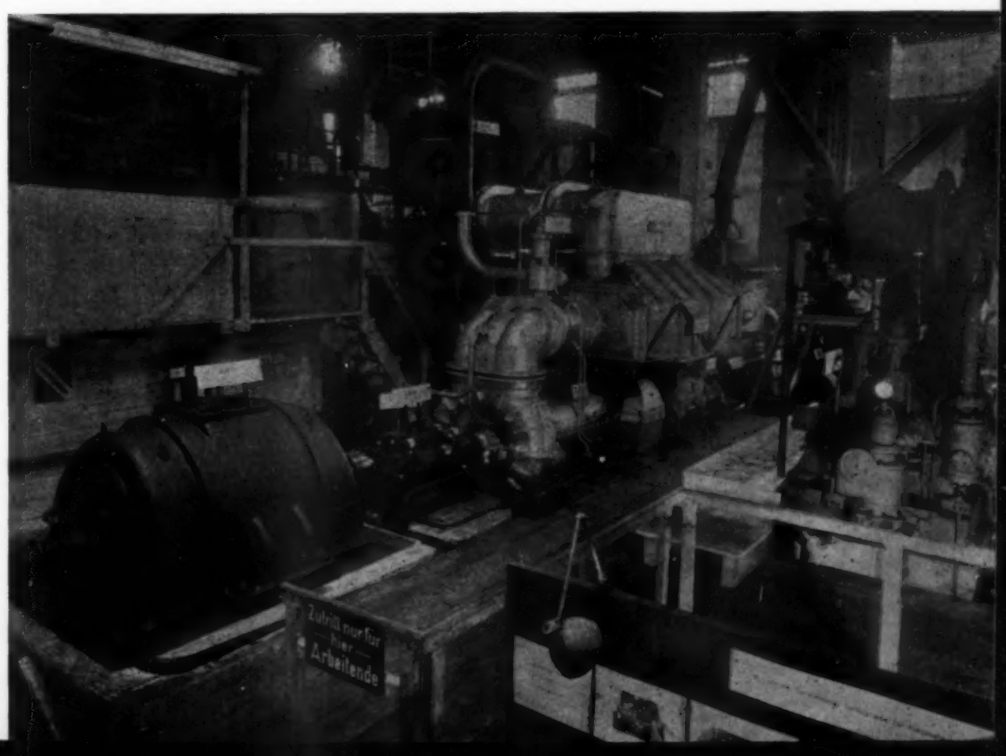
Up to date, a Diesel engine has never been built which successfully burned coal. However, it looks very likely that the gas turbine can be built to burn coal in its combustion chamber. Of course, coal may be utilized as fuel in the Diesel or gas turbine if that coal is first processed into oil. The by-product of this process may permit the oil to compete in price with the natural oil taken from the ground.

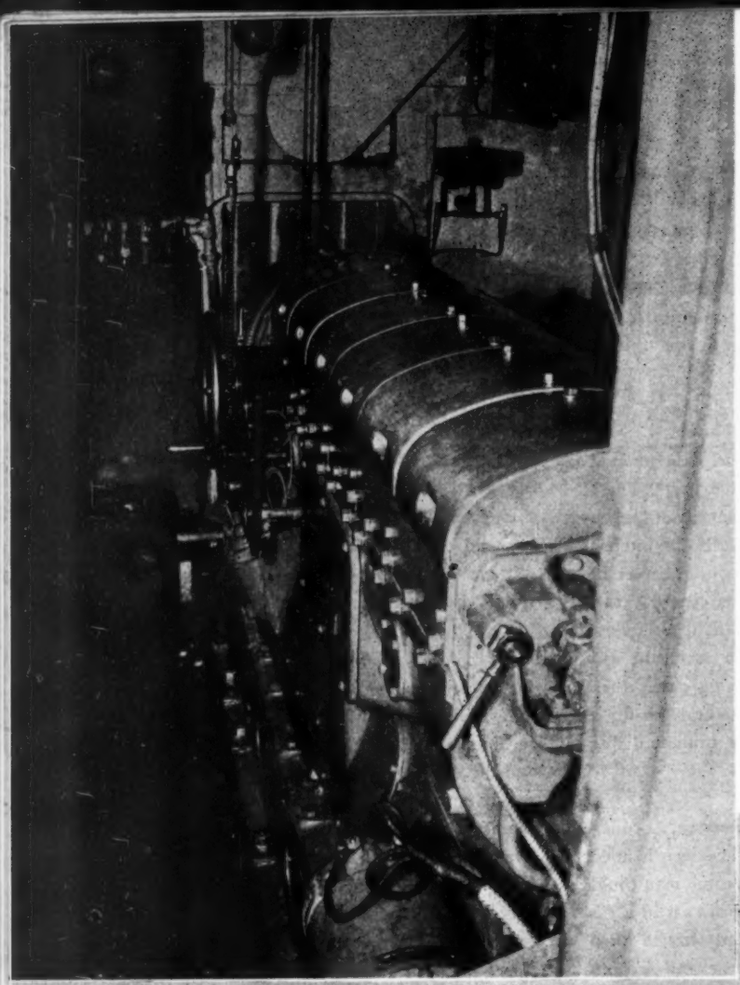
Again, we should emphasize that the coal burning gas turbine will no doubt, be of large sizes, even larger than 2000 hp. or in the neighborhood of 5000 hp. or up, in order to have suitable characteristics with variable load and speed when desired.

Summary

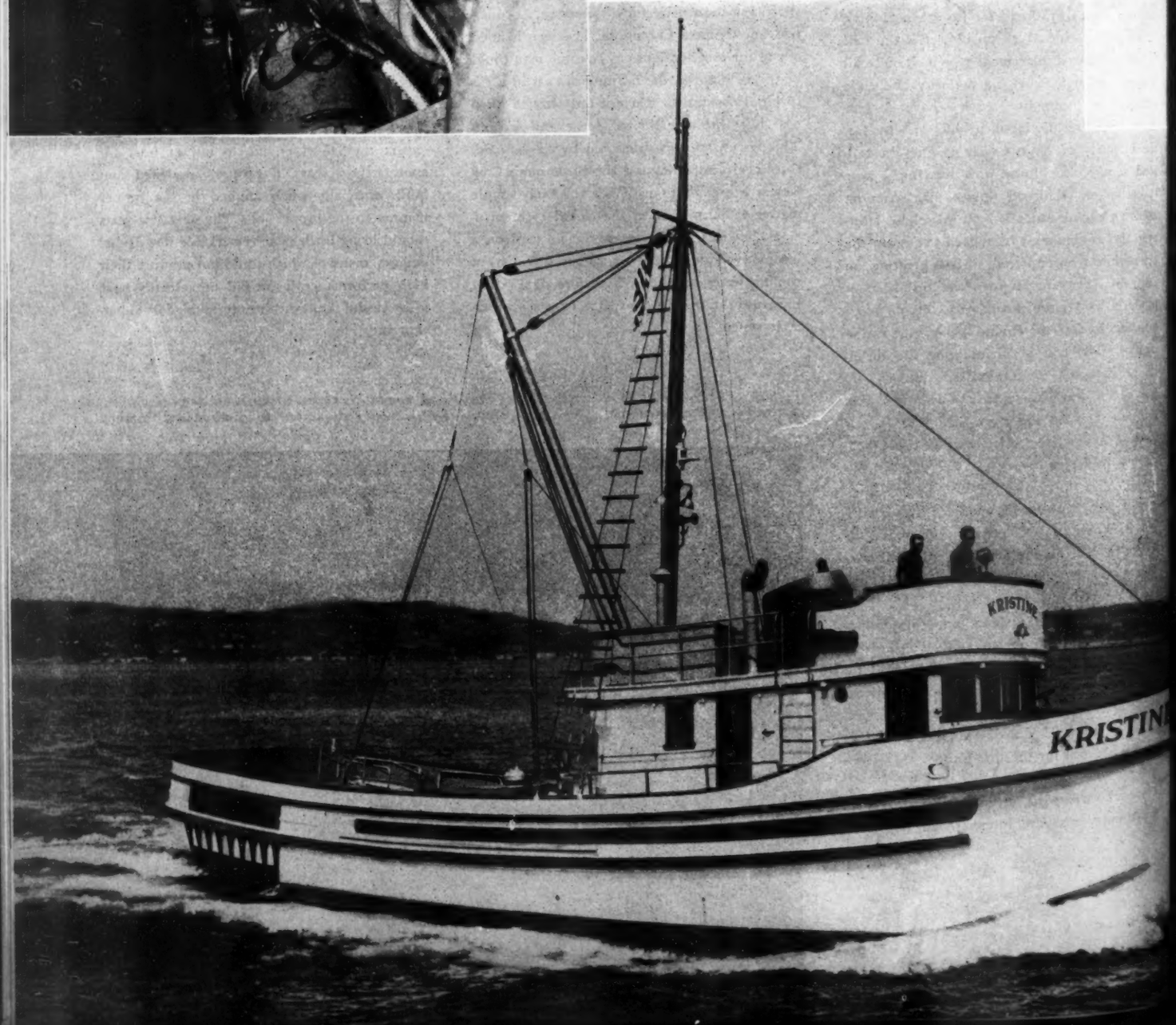
We therefore, find that the Diesel man who has vision and foresight will welcome the gas turbine. We have found that the gas turbine and the Diesel engine are the two prime movers which burn air and fuel in their combustion chambers and that air and fuel combined delivers the power directly to the piston or turbine blades. The gas turbine is unquestionably in its infancy but definitely on the road to success. The history of the Diesel engine shows that it is close to fifty years old. We can expect the Diesel engine to last at least for another fifty years, if properly designed and built, especially when applied in the proper manner to the proper job. The next few years should bring forth some remarkable new Diesel engines, many of which could not produce their high performance if we did not already have a successful gas turbine suitable for supercharging.

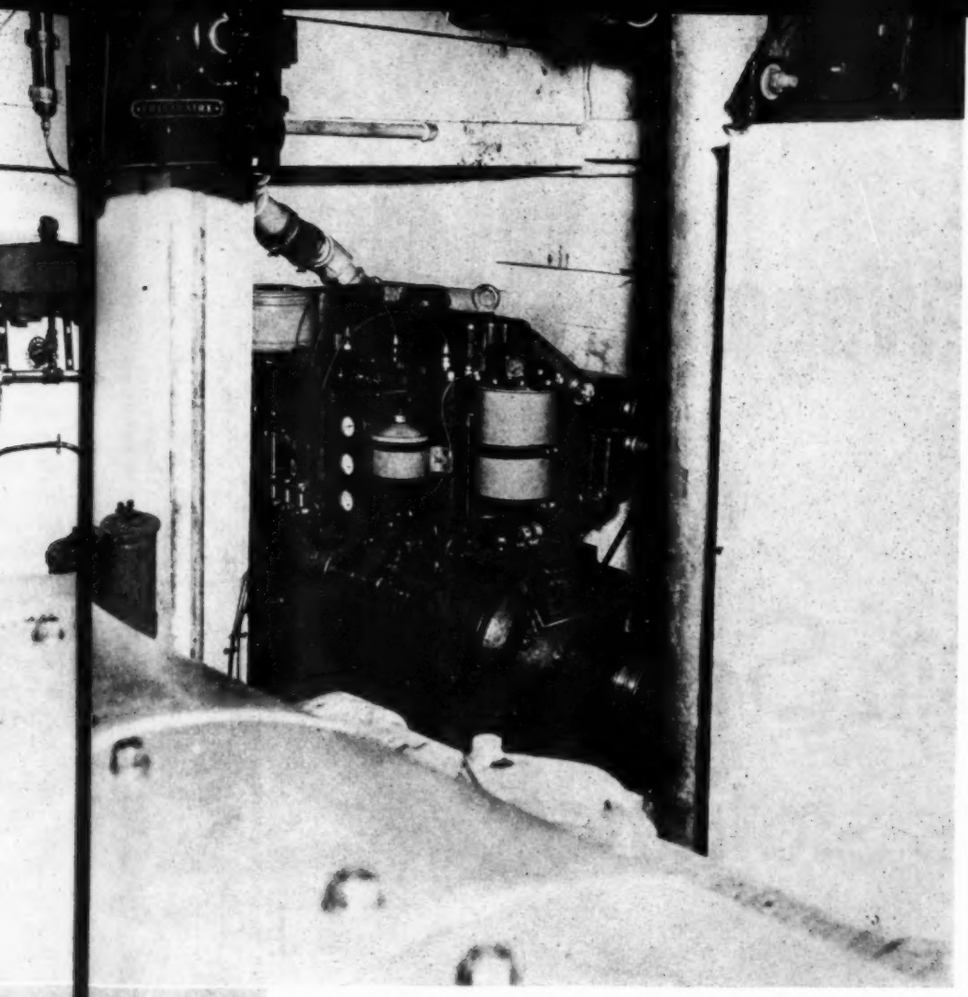
Fig. 17. Experimental 1500-kw. Pulverized-Fuel-Fired combustion gas turbine on test at Baden, Switzerland. Powdered coal pile is seen, upper right, directly connected to combustion chamber.





Left: Control side of the 190 hp. Joshua Hendy main Diesel. Above: Capt. Konrad Uri of the "Kristine." Below: She shows up well on trial run.





The Sheppard Diesel auxiliary unit with Twin Disc clutch.

A NEW DIESEL ENTERS THE MARINE FIELD

By CHARLES F. A. MANN

FIRST of three Puget Sound "Firsts" in the Diesel-Marine field, all of which were finished and away at sea the end of August, was the novel little combination Halibut-Tuna-Dragger boat completed at Puget Sound Boatbuilding Co.'s plant at Tacoma early in August, carrying a compact lightweight Hendy Diesel main engine.

The little vessel, named *Kristine,* owned by Messrs. Konrad Uri and Sverre Aure of Seattle, has a stout Fir hull 67 x 18 x 10 and is distinctive in fishing gear in that it carries a Northern Dragger, trick combination of fully enclosed winch, gypsies, etc., built by Tacoma Boat Building Co., sponsors of a big fleet of wood and Diesel vessels in their own right.

The hull was designed by Ed Monk of Seattle, and carries a crew of 10, 7 in the forecastle below and 3 in the captain's cabin atop on the main deck. It also carries 3,500 gallons of fuel oil and 1,000 gallons of water; a roomy galley with large built-in ice box, cooled by a Frigidaire installation. Dual pilot house controls for the main engine, both inside and outside, including steering gear; a Perko searchlight and Maxim silencers complete the major items of deck equipment, with, of course, a Lineshaft drive from the main engine to the Anchor Winch and the Northern Dragger. The Anchor Winch was made by Puget Sound Boatbuilding Co., who also executed the detail designs for the vessel.

The compact, lightweight power plant is centered around the 190 hp. 6 cylinder Hendy Series 20 Diesel, which turns at 900 rpm. and drives a 60 x 48 inch Coolidge propeller through a 3 to 1 Twin Disc reduction gear.

The Hendy Diesel weighs 12,400 lbs. and is fully enclosed, and equipped with Bendix Scintilla unit injection pumps, built-in heat exchanger and chain driven overhead camshaft, with Weston tachometer and Alnor pyrometer. Auxiliary power is supplied by a 25 hp. 3 cylinder Sheppard Diesel, of ample size for future refrigeration equipment. This drives a 2 kw. Kato generator, a De Laval bait pump and a Quincy air compressor. A 2 kw. Leece Neville auxiliary generator is belt driven off the main engine. A Hobbs 32 volt battery set is supplied, and the vessel carries a 65 watt Northern radio telephone and Karr radio direction finder. McDonald fresh water sanitary pump and Marine Products bilge pump (hand) is supplied. The Hendy Diesel was supplied by Leon Sutter of Alaska Pacific Supply Co. of Seattle, Northwest Hendy Distributors.

Tank Wagons for South Sea service stations

These ships played a big part in keeping bombs falling on Tokyo. They're tankers that rushed high-octane gas and lube oil to the Pacific air bases.

A fleet of 23 recently built are completely GM Diesel powered. They carry seven General Motors Diesels each, for everything from main propulsion to small auxiliaries.

The Navy knows these engines leave more room for cargo, are easily maintained and can be counted on to earn a "Well done" on any job.

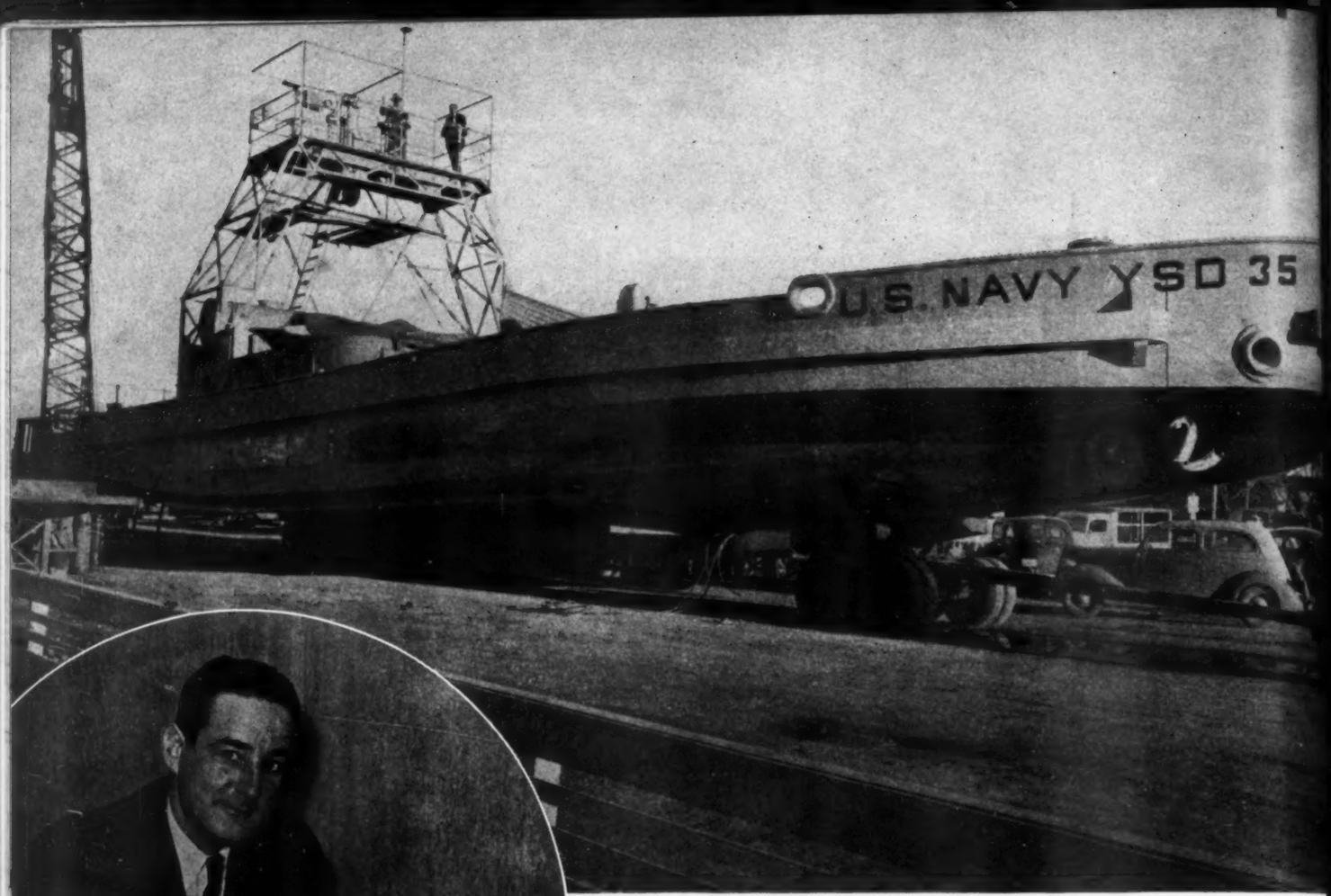
GM
GENERAL MOTORS
DIESEL POWER

ENGINES 150 to 2000 H.P. CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

SINGLE ENGINES . . Up to 250 H.P. / MULTIPLE UNITS . . Up to 800 H.P. } . . DETROIT DIESEL ENGINE DIVISION, Detroit 23, Mich.

LOCOMOTIVES . . . . . ELECTRO-MOTIVE DIVISION, La Grange, Ill.

KEEP AMERICA STRONG
BUY VICTORY BONDS



This Navy YSD looms up large as it moves on trailers hauled by an Allis-Chalmers tractor powered with General Motors Diesel.

DIESEL DEALER BECAME WAR PLANT

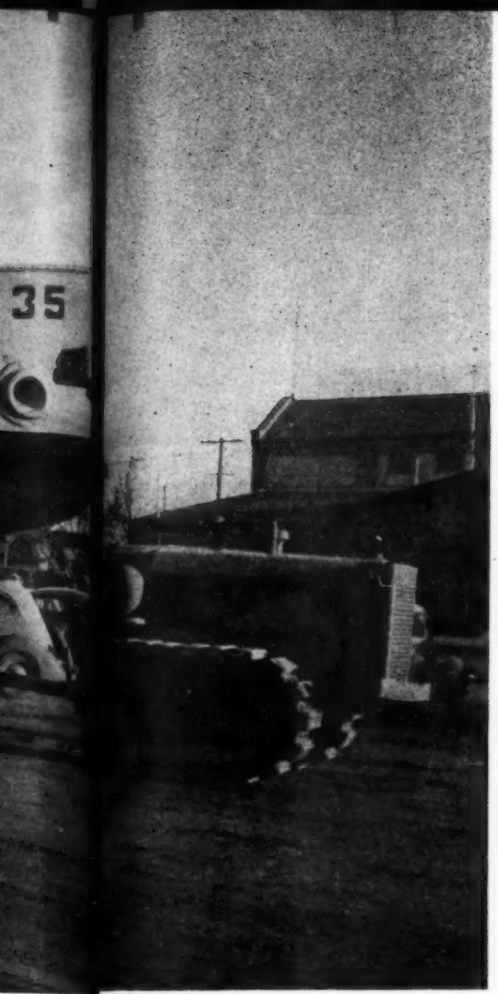
By F. HAL HIGGINS

The boss of Moore Equipment Company, Stanley Moore.

ONE of the outstanding Diesel dealers in the West if not in the world in this war picture is Moore Equipment Company, Stockton, California. Moore shifted from peace to war in a big way to meet his country's call and became an important Diesel boat builder in spite of his inland location. Now, the Moore company is a real contender in the heavy construction equipment manufacturing field ready to meet competition with its own line of products powered by General Motors Diesel engines and Allis-Chalmers Diesel tractors with the same brand of power.

Your Old Reporter recalls the Moores—Father and Son, J. Stuart and Stanley S.—as just another Allis-Chalmers tractor dealer a few years ago. Being located in the same town as the famous "Bob" LeTourneau, whose line was closely tied up with the rival Caterpillar tractor dealer, young Stanley Moore found no available dirt moving equipment he liked well enough to team up with A-C tractors he was trying to sell. So, Californian-like, he just sat down and drew plans for the kind of scraper he wanted to meet the demands of his contractors. That's only ten years ago, back in 1935, at the bottom of the depression when the Diesel tractor was proving the answer to farmers and contractors having to cut their way out of the red. Moore knew the contracting game and some good sound contractors who believed in him and his products from the first. So, he has kept gaining in one of the toughest tractor and dirt-moving arenas in the world when the competition was the ruggedest and every contractor figured his chances right down to the last yard of dirt and foot of haul.

The writer recalls going to see the younger



Moore only three years ago and finding him bent over a drawing board as he figured how he could take on Navy contracts to build boats. "Come back and see me when I get these boats built," Stanley said. But he has been out of sight ever since on this war program that has meant so much to the men in the Pacific who had to have landing barges with the Diesel engines powering them. Each time a visitor dropped into Stockton since then he has seen the Moore plant out on Wilson Way busier and bigger with Diesel trucks and special trailers hauling away LST and other landing barges and boats. Now, with one war over and another warming up for a red hot finish, the Moore plant has suddenly appeared with new modern offices and big plans for the future of the West that is to come with peace. Moore is full of plans and his plant is ready to switch from war machines to peace equipment. Even now, with the food situation one horrible mess from the mishandling it has received from Washington over the past four years, the Moore organization has been able to utilize its space and labor to turn some steel into badly needed heavy disk harrows to help get the 1945 food crops started in a year when every ounce of food will be needed.

But the Moore Company is no longer a mere father-and-son team. Father has retired and Stanley has gathered around him one of the best balanced tractor, truck and heavy construction equipment factory and dealer personnel organizations in the West. And this team he has gathered has been working together long enough and efficiently enough to deliver the goods with no loss of motion. They knew the heavy equipment game as powered with Diesels before war came; they know it better now. For every boat they have turned out has been powered by Diesel engines. Diesel trucks haul the boats from factory to water.

Diesel engines power the factory in every spot where engine power is needed. They are the power that makes the wheels go round to produce the war goods, and also the power to deliver those goods to the Navy.

Recently, after two or three visits with General Manager L. W. Ribal, the writer has got him to tell what and how the Moore organization has changed from peace to war, what they have done in this war to date, and then to give DIESEL PROGRESS readers some idea of what they plan for the future.

Says General Manager L. W. Ribal: "Our company was originally organized in April of 1930 as a registered co-partnership consisting of J. Stuart Moore and Stanley S. Moore, his son. This venture was a local organization covering San Joaquin and adjacent counties in the sale and distribution of Allis-Chalmers tractors and allied farm equipment. The organization originally employed a total of five people and was located in a small building in the business district.

"In 1935 we were successful in developing allied equipment to go with the Allis-Chalmers tractor line: bulldozers, power units, rippers, scrapers, etc. This equipment was patented both in the United States and in the British Empire and became a very necessary part of our business.

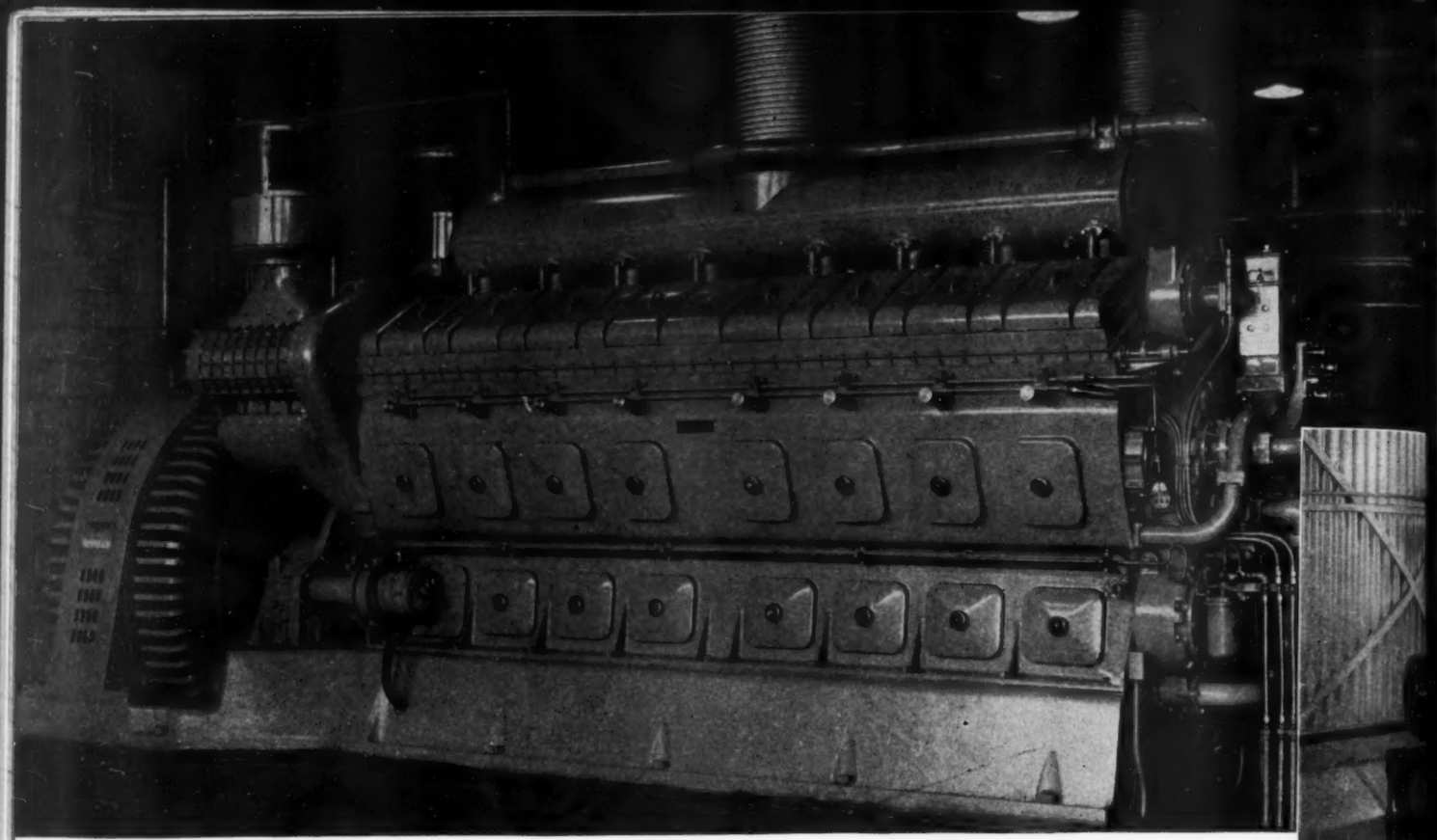
"In 1936, the business had expanded to the point where we located on South Wilson Way, erected our own building and took on such other lines as General Motors Trucks, General Motors Diesel Engines, etc. From here on the business began to expand very fast. In 1941, at the start of the war, we were firmly established as a manufacturing concern plus being one of the largest distributors of industrial and farm equipment in California, employing approximately 150 people. We had as territory the Central California area.

"In the early part of 1942, manufacturers' supplies began to run low. We looked around for other sources of income and having facilities for manufacturing, took contracts with the U. S. Navy to build LCM (6) 56 ft. invasion barges, YSD 103 ft. vessels, 500-ton non-self-propelled barges, various subcontracts for miscellaneous parts for other Navy contractors, etc.

"During the war we have built an enviable record in the production of vessels for the U. S. Navy. In recognition, we were awarded the Army-Navy 'E' for high-quality efficiency and outstanding production of war material for the armed forces. We have subsequently received three additional stars, or three six-month periodical continuances of the original award which substantiates the fact that our production has been steady, normal and progressive throughout the war years.

"With the Navy production, we have also performed various contracts for the U. S. Army Ordnance Department, among them being the remanufacture of ¼-ton 4x4 jeeps, crating of

Product of Moore Equipment Co., this landing craft is powered with a pair of series 6-71 General Motors Diesels.



Moore takes his own medicine. This engine, product of Cleveland Diesel Division, General Motors, is one of several which power the Moore plants.

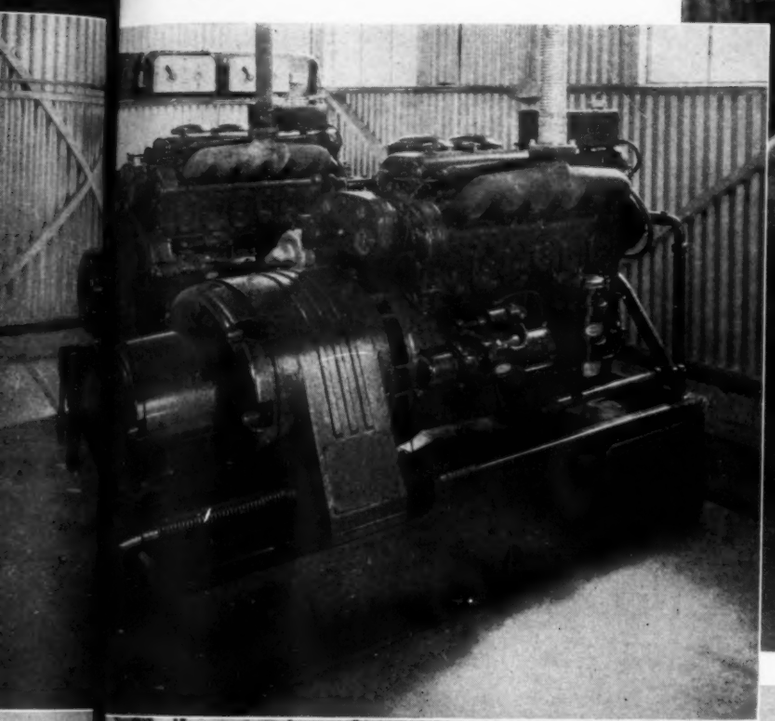
¼-ton trailers and crating for export of ¼-ton 4x4 jeeps. Our total payroll during the war time years has been as high as 1,000 people in our three plants—two at Stockton, and one at Modesto, California. At the present time, sufficient contracts are on hand to keep our facilities regularly employed for approximately eight months, all products being vitally needed in the war against Japan. Vessels completed have run into the hundreds, and money values of completed vessels into millions of dollars.

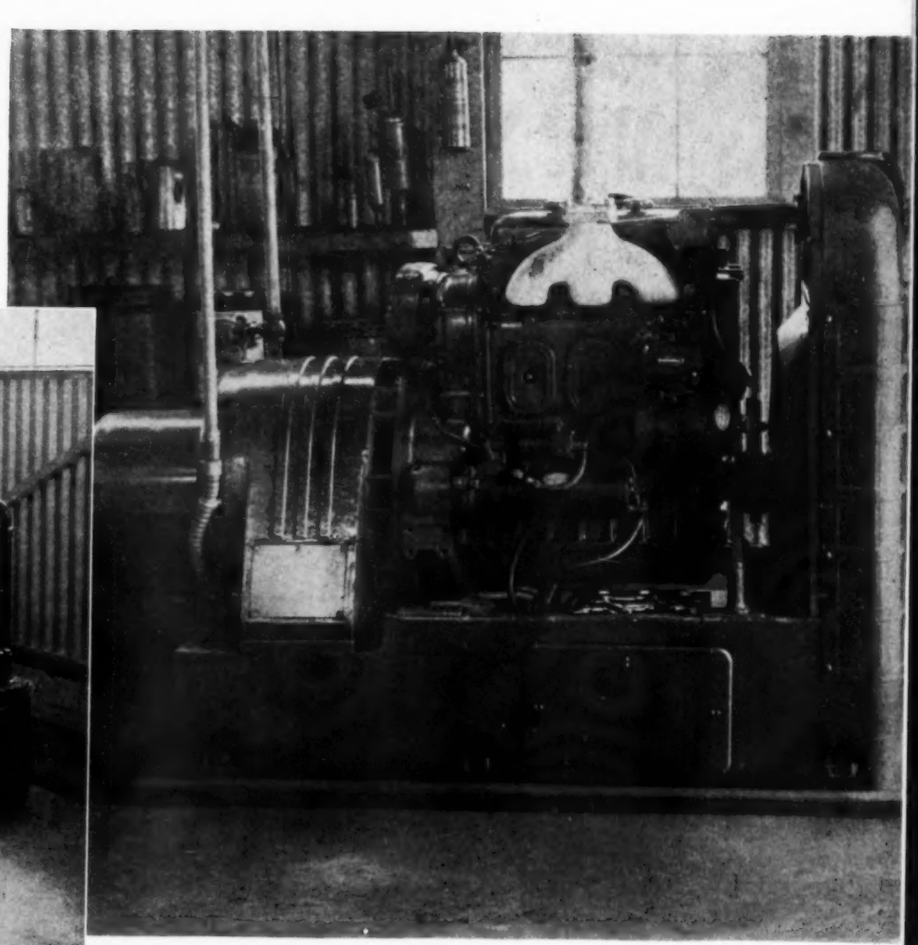
"Inasmuch as our Stockton main plant yard is located approximately five miles from the nearest water, it was necessary to transport all completed vessels via our own transportation facilities from the plant for launching. This involved the construction of special trailers which would handle the transportation of weights from 40 to 150 tons. The solution of this transportation problem was due to the fact that prior to the war our company had varied experience in the transportation field, covering both practical application of heavy loads and technical engineering experience which enabled us to handle urgent wartime problems. Our present plant facilities have been expanded with postwar uses in mind: providing one of the largest facilities on the West Coast for the sales, service and transportation of heavy industrial contractors' equipment.

"With the idea in mind that the future holds great promise in the construction machinery field, our company has thrown its entire interests in that direction. We have taken on such nationally known lines of equipment as Koehring, Ingersoll-Rand, Kwik-Mix, C. S. Johnson, Parsons, General Motors Diesels, Gorman-Rupp, etc. These complete lines added to our present manufacture of road machinery, plus our present lines of Allis-Chalmers farm and industrial equipment and General Motors Trucks, present a complete lineup of equipment for the construction trade; again presenting truly a combination of services. We will represent most of these lines in a territory which will embody Northern California and Nevada. To properly service the anticipated volume of business we have opened offices in San Francisco. Tentative plans and arrangements are now being made to erect suitable showroom and service facilities comparable to those now located in Stockton to house our future San Francisco operations. It was deemed necessary that the San Francisco installation be accomplished at the earliest possible time, inasmuch as a larger part of the contractor trade have their head offices in the Bay Area.

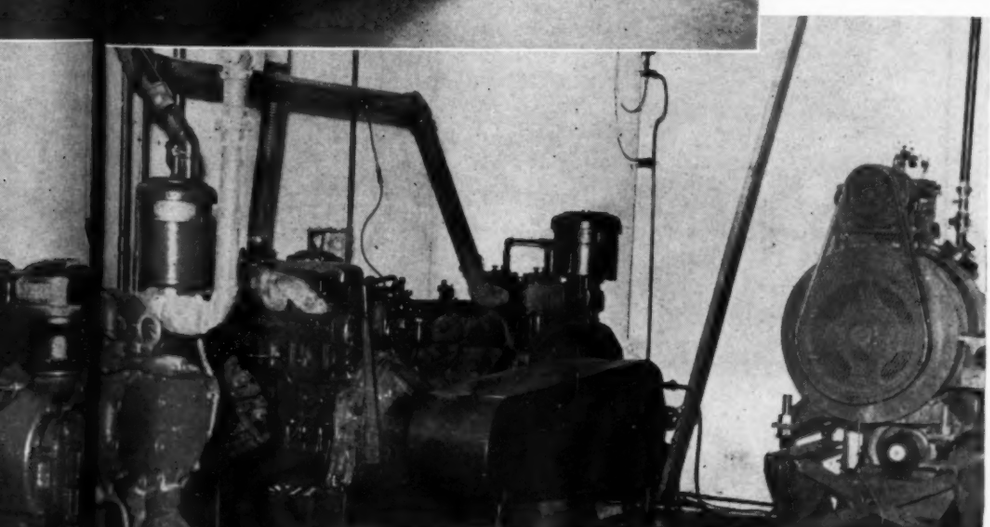
This, together with an elaborate service program is being inaugurated due to the fact that the officials of our company have great faith in the future of the Pacific Coast and in the many construction programs which we believe will go forward in this area."

A pair of GM 6-71 Diesels Moore installed for Crum-Brainard Company, Los Angeles.





Another Moore job, a G-M 3-71 Diesel in the Bondurant Mining and Milling Company, Coulterville, California.



Moore-built ripper behind Allis-Chalmers, G-M Diesel tractor

"SP" SHOP KEEPS MAINTENANCE DIESELS WORKING

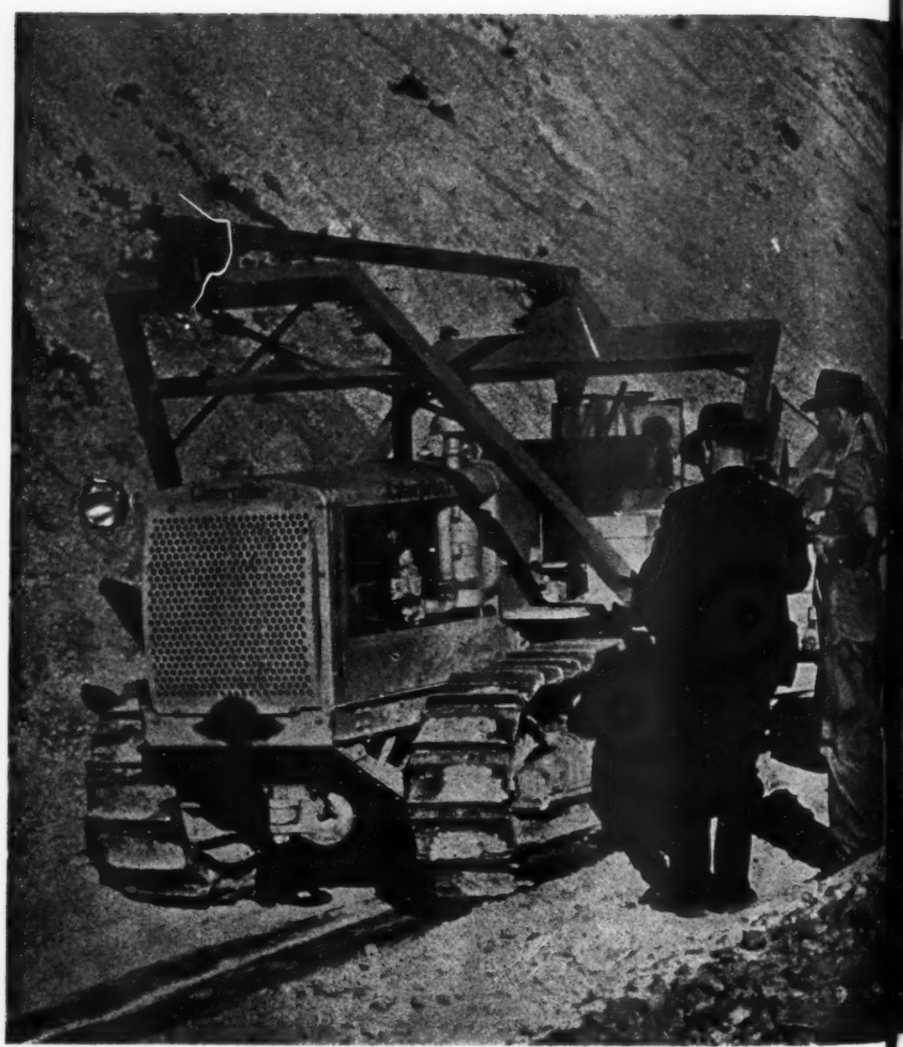
By F. HAL HIGGINS

NO railroad in the U. S. is more in this World War II than the Southern Pacific. It has been a pioneer since the days of Stanford, Huntington, Crocker and Hopkins—the Big Four—who built the railroad that connected the East with California and then went on to develop the "SP" system as one of the great transportation systems of the West.

War has brought the S.P. its maintenance problems and those problems have brought Diesel tractors, shovels, compressors and trucks out into the battle and made them highly important in getting the job done with less men to keep the roadbeds carrying record loads of soldiers, sailors, guns, ammunition, food, etc., required to serve fighting fronts and win wars.

R. B. Chapman heads the SP's System Maintenance of Way Repair Shop in West Oakland. He is Supervisor of Work Equipment and Welding. Under Mr. Chapman is Shop Foreman T. S. Bean. They started with nine men in October, 1936, just three years before the second World War broke in Europe. The staff of employees under Mr. Chapman now numbers 47, which gives you an idea of what a terrific strain the old SP has on its right of way as it delivers the men and goods in this war.

Your Old Reporter hunted up Supervisor Chapman recently and followed him from his San Francisco office over to the West Oakland shop where he interviewed him and Shop Foreman Bean. "The SP started purchasing tractors in 1924 with a pair of tractors," recalled Mr. Chapman, as he reviewed his company's increasing dependability on tractor power for right-of-way maintenance. "One of that first pair of tractors is still working for the SP," he added. "The tractor is here to stay and the Diesel tractor has proved its economy. We also have Diesel shovels, compressors and trucks. We now own 33 tractors on our Pacific Lines from here to Ogden, Utah, and Tucumcari, New Mexico. Every tractor has a bulldozer attached, as we are finding them very economical and successful in bank restoration in these wartime days of labor shortage and overworked and overloaded road beds.



"We early saw the need for heavier tractors after getting into tractor use. They work every day but Sunday and are liable to be called to a washout job at a moment's notice anywhere on the lines. When we first bought tractors, we had trouble keeping them busy, but we learned a lot of uses and soon found them used all the time with demands for more and more tractors."

As to the shop where the equipment including the Diesels is repaired and serviced, here is a statement OK-ed by Mr. Chapman:

"Arrangement of the shop was planned to expedite handling of all types of road equipment. A huge overhead traveling crane, capable of handling the largest implements received in the shop, was installed in the central section. (The crane is a salvage item taken from SP's West Oakland sub-station when it was abandoned in July, 1941.) Equipment is unloaded

Operation on Line change, San Joaquin Division, using a pair of Caterpillar Diesel tractors and self-loading Carryall.

Cut cleaning with 4-yard Carryall and Caterpillar Diesel tractor at Sacate, California on the "SP" Coast Division.

by the crane from flat cars, which can be rolled into the shop, to a dis-assembly line from which parts are taken to various sections for repair. These sections are divided to accommodate Diesel engines, gasoline engines, body and fender work and painting, welding and automotive repairs. Structural repair work on large equipment is done on the dis-assembly line. One corner of the plant is devoted to a machine shop. There is also a tool room containing a large assortment of hand tools and power tools for cylinder boring, valve grinding and other mechanical repair work.

"In 1944 over 250 major equipment items were completely overhauled and numerous smaller repairs were made to other machines—equipment that had seen service on rough jobs all along SP's right-of-way.

"These men supply and maintain machinery for such on-line jobs as laying rail where section and extra gang laborers use burro cranes, tie tampers, bolting, welding and adzing machines, and air drills. When bridge and building gangs set up to build a bridge they are supplied with concrete mixers, air drills, welders, carryalls and bulldozers for filling in around abutments, and other power tools. Ditchers, power shovels, dump trucks, plus many of the above-named machines and a lot more, are required for such projects as line changes, bank restorations, repairing storm damage, and other grading work. . . .

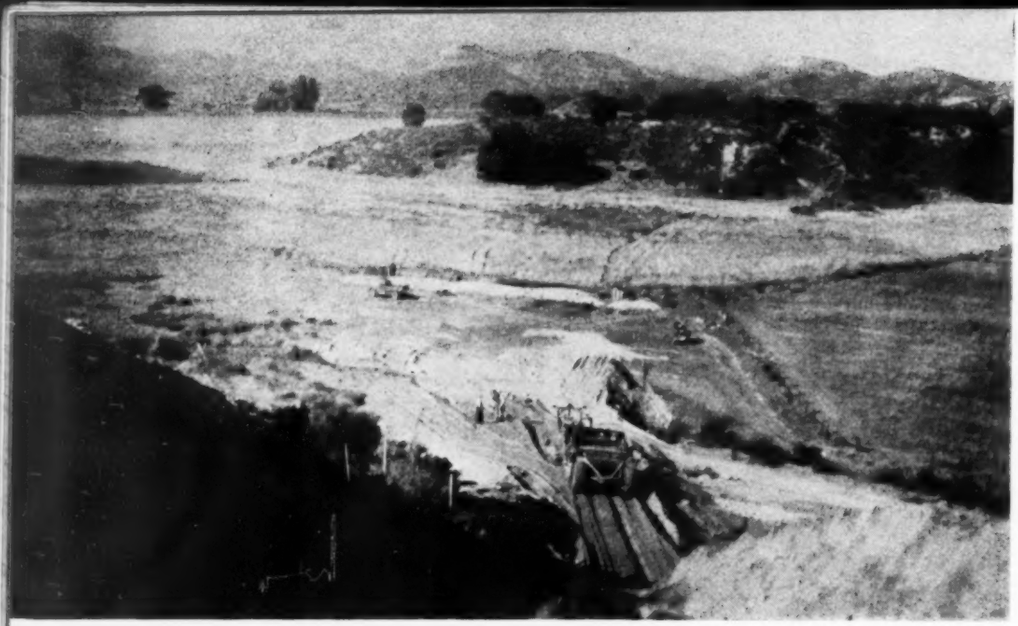
"One of the biggest problems confronting the shopmen is keeping sufficient stock of parts on hand to replace those that wear out. Orders for all parts are handled by West Oakland stores which is adjacent to the shop. Items used in quantities are kept in stock there for emergency use. Many parts are obtained from the manufacturers direct and some are made at Sacramento Shops.

"Salvage is a by-word with mechanics in this plant. Parts that have been worn far beyond their useful stage are reclaimed by welding and metal spraying. Such items as worn bulldozer blades are renewed by welding. Worn shafts are built up by spraying with metal. Some Diesel engine crankshafts that have been reconditioned in this manner are in use and it is believed they will give as good service as the original shafts."

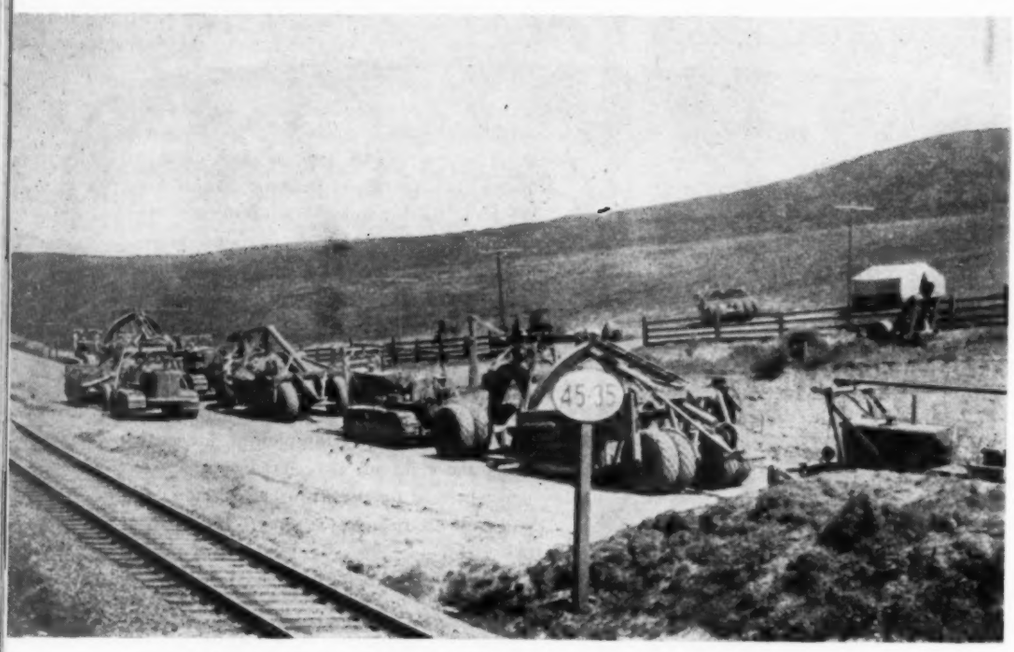
Says Railway Engineering and Maintenance of the S.P. Crawler tractor work: "The tractors were acquired largely for plowing fire guards along the right of way. Two-wheel scrapers were obtained for use with these tractors, of a type that is dumped by a rope in the hands of the tractor operator. Eventually, both tractors were fitted with bulldozer blades.

"About half the tractors owned by SP are used principally as power units for hauling carryalls; others are employed in combination with the carryall units to perform such tasks as spreading and shaping deposited material, pulling rooters and pushing the carryalls when loading; and still others are used for a wide variety of miscellaneous tasks.

"It is hoped eventually to have sufficient crawler tractor bulldozers to permit at least one to be assigned to each roadmaster on the road, of whom there are 61. The reasoning is that, in view of the high versatility of the tractor bulldozer, there is sufficient work to be done on each roadmaster's territory, such as the plowing of fire guards, the restoration of the roadbed, the cleaning of cuts and a multitude of related



Diesel tractors at work at the beginning of Fill-Line change, Tunnels 21 and 22.



Diesel equipment along "SP" right-of-way idle at lunch time.

Diesel equipment in clear for passing of "SP" Daylight Special.

tasks, to keep at least one of the machines busy practically all of the time.

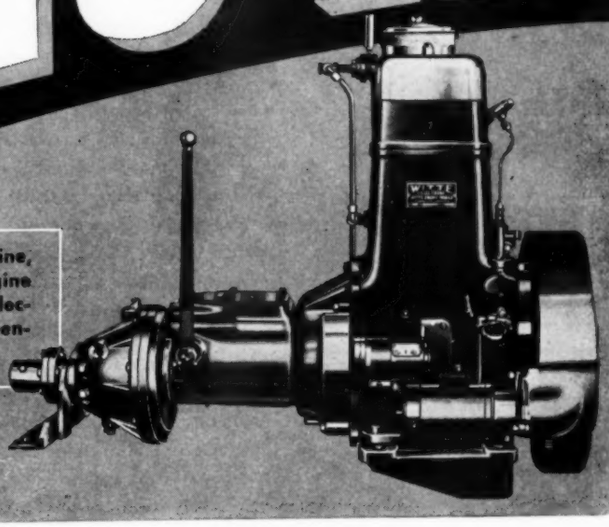
"An example illustrating the value of crawler bulldozers in emergencies is afforded by a recent incident on the Southern Pacific in which the availability of a machine of this type was an important factor in helping to clear a single-track main line following a derailment. In this incident, which occurred in mountainous territory, a locomotive was derailed by a slide as it emerged from a tunnel. At this location, the track is situated in a side-hill cut, and the slide, coming from above, caused the engine to be derailed in the downhill direction. To clear the track and to permit the engine to be re-railed, it was necessary to remove the slide material from the area between the locomotive and the uphill side of the cut. At the time of the derailment, there was available in the vicinity a quantity of heavy grading equipment owned by a contractor, but it was apparent that this was too large to permit it to be used and maneuvered in the space available. However, the company had available in this territory a Diesel tractor with a dozer blade, which was suitable to the task, but the problem was to get it to the site of the derailment, which was somewhat remote. This was solved by loading the tractor on two push cars drawn by a motor car and moving it to the site through the tunnel. So effectively did the bulldozer cope with the situation that a special push car has now been built for transporting it in the event of future emergencies of this nature."

"Looking back at the old horse plow system of plowing fire strips along the SP right of way," said Mr. Chapman, "the tractor gave us a faster, cleaner and wider strip—a far better job. We clean out under bridges with the tractors now, as well as under trestles to prevent clogging and washouts. They have been very handy for tunnel eliminations, too. Out from Lompoc a little way the SP will soon be using these Diesel tractors on a job of track straightening between Surf and Gaviota to strengthen the SP roadbed along the ocean."

NOTE: Diesel equipment employed by Southern Pacific's Maintenance of Way includes Caterpillar, Allis-Chalmers, International and Cletrac tractors. The Caterpillars and Internationals are powered with Diesels of their own make—the Allis-Chambers and Cletrac tractors have General Motors and Hercules Diesels, respectively. Also included in this class of equipment are numerous compressors powered with Buda, Hercules, General Motors and Chicago Pneumatic Diesels and Waukesha Hesselman engines.

Witte specifies...

AUTO-LITE



Diesel Marine Engine, built by Witte Engine Works. Auto-Lite Electric Starting and Generating Equipment.

WITTE, pioneer builders of small Diesel engines, know the importance of high quality, dependable starting and generating equipment for Diesel engines. That's why they specify AUTO-LITE.

Thirty-two years of experience in building automotive electrical equipment have given AUTO-LITE the know-how and the facilities for helping Diesel manufacturers to solve difficult problems of electrical starting and generating.

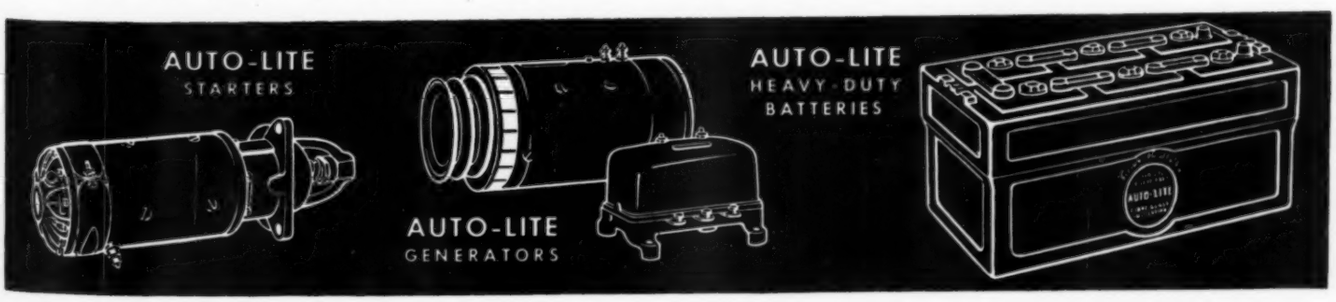
Engineers and executives interested in Diesel manufacture are invited to consult Auto-Lite on problems involving electrical cranking or generating equipment.

BUY MORE BONDS

THE ELECTRIC AUTO-LITE COMPANY

TOLEDO, 1, OHIO • SARNIA, ONT.

TUNE IN "EVERYTHING FOR THE BOYS" STARRING DICK HAYMES—EVERY TUESDAY NIGHT—NBC NETWORK



LEGAL NEWS

By LEO T. PARKER*

REVIEW 1944-45 LAW SUITS

RECENTLY, the higher courts have rendered many unusually interesting decisions pertaining to Diesel engine manufacturers and users. Obviously, knowledge of these late and modern citations will assist readers to win law suits. Also, since the citations may be utilized to assist in winning unavoidable suits, it is advisable for readers to file away these valuable citations for future reference.

There is truth in the assertion that "every law suit can be avoided." This is so because no one will enter legal controversy without a chance to gain a favorable verdict. For example, a few days ago an official of a Diesel service company wrote as follows:

"We leased the building we now occupy for five years at $375 per month. The lease expires in about five weeks, but we will not be ready to move into our new quarters until about three months. We are willing to pay $375 per month rental for the time we use the building after the date the lease contract expires. The owner of the building, however, demands that we pay $800 additional for use of the building, until we move into my new quarters. Please inform us if we are in any way liable for any payment above the monthly rentals, if we hold the building a few months after the lease contract expires."

The legal advice given in regard to this simple question was: Do one of these three things: (1) vacate the building before midnight of the day the lease contract expires; or (2) pay the additional $800 demanded by the owner of the building; or (3) stand the liability to pay $22,500 for use of the building, whether or not you occupy it, for another full period of five years at the old rental rate of $375 per month.

The courts have consistently held that rental, lease, employment, and all other contracts are automatically extended for a period equal to the term of the original contract, providing the same relations between the contracting parties continue at the time and after expiration of the contract. See the leading case of Magnolia v. Davidson, 38 S. W. (2d) 634.

Law of Fixtures

Few readers realize the importance of being able to distinguish between ordinary chattels and legal fixtures.

For example, in Arco Company v. Hawthorne Company, 38 Atl. (2d) 290, reported September, 1944, it was shown that a building was specifically constructed for manufacturing purposes. A considerable quantity of manufacturing equipment as pumps, Diesel engines, condensers, and the like were installed in the building. The owner of the building and land on which it was situated gave a mortgage thereon. Later it was contended that the various manufacturing equipment was not a part of the real estate and, therefore, the mortgage on the real estate should not include the equipment. However, the higher court held that the real estate mortgage covered and included the land, building thereon and all manufacturing equipment. This court said:

"It is apparent that the owner of the building adapted it to the specific use for which it was constructed and equipped. . . . The various appliances were actually annexed to the freehold. They were fitted for and applied to the use to which the real estate was appropriated, all being designed for and necessary to the prosecution of a common purpose. Thus, the machinery and land became unified, and incorporated together as a whole."

The importance of this decision is readily apparent. Thus the seller of Diesel engines may forfeit his lien, although he sells the equipment on a conditional contract of sale, in event the holder of the real estate mortgage decides to foreclose. Also, assume that the building is sold to a new purchaser. This purchaser may claim that he bought and owns not only the land and building thereon but, also, the equipment therein.

Therefore, irrespective of special contracts, or special chattel taxation, or special agreements the holder of a mortgage or new purchaser of the land and building automatically become the legal owner of all Diesel engines and other equipment which are "legal fixtures." And this is so although the seller of the equipment holds a properly recorded chattel mortgage on such equipment.

On the other hand, the law is well settled that when a seller sells "personal property," as Diesel engines, with the view that it shall be temporarily used in a building, whose owner executed a chattel mortgage, such seller holds a prior right against a new purchaser of the building, or the holder of a mortgage on the real estate, provided the equipment is so attached to the building that it may be removed without damage to the building.

Employment vs Partnership

Sometimes the courts have difficulty in distinguishing employment contracts from partnership agreements. However, as a general rule an ordinary contract of employment may be terminated at any time by the employer, whereas neither partner can terminate a partnership agreement without consent of the other partner, or by order of a court.

For example, in Nash v. Bertram, 155 Pac. (2d) 603, reported April, 1945, it was shown that a man named Bertram, had been a mechanic and machinist for 36 years when he set up the business of operating a machine shop, which was located on the rear of his residence lot. His principal business was reconditioning Diesel pumps and valves. Soon his business increased and he hired several employes in his shop. Then he contacted a man named Nash and employed him to compose, write and mail to various machinery companies, contractors, municipalities, other concerns, and individuals, letters explaining Bertram's business and soliciting patronage. The agreement between Nash and Bertram was reduced to writing. An important clause in the contract was, as follows: "This Agreement made and entered into this 11th day of December 1941 covering the business of reconditioning of Diesel fuel pumps and valves.

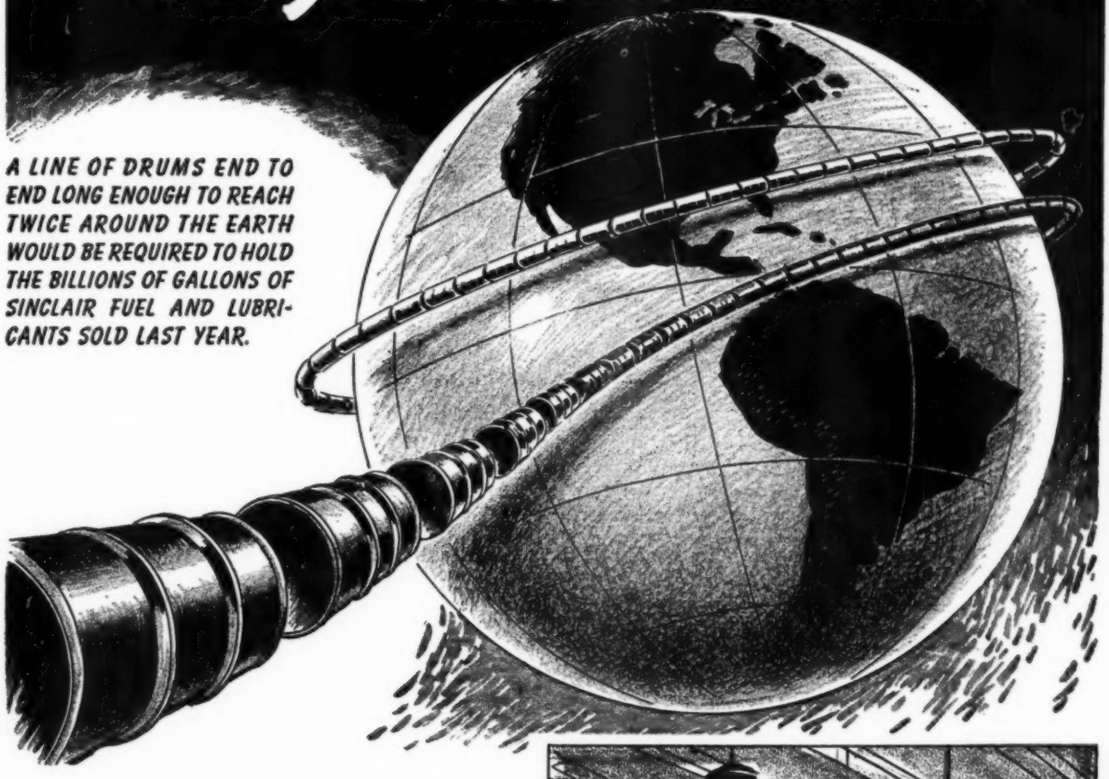
"It is understood and agreed that the net profits of the business will be divided as follows: 60% of the net profits to Bertram and 40% to Nash, and to arrive at net profits all necessary and regular expenses of the business to be deducted

. . . . *And now please turn to page 86* . . . .

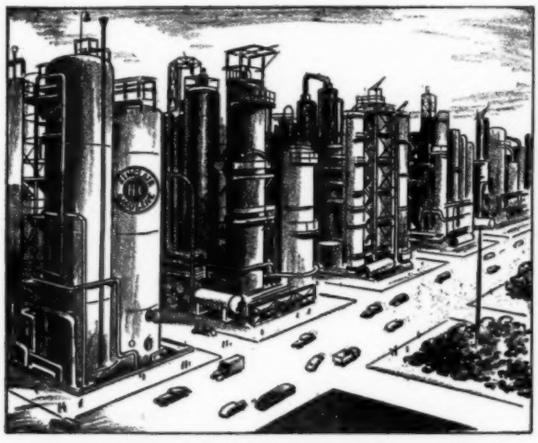
---

* *Attorney at Law, Cincinnati, Ohio*

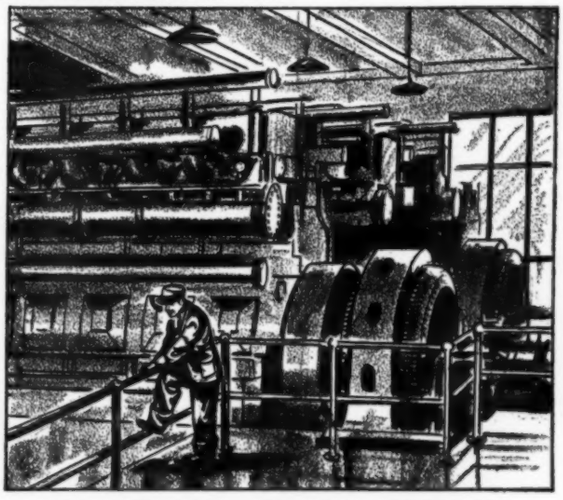
Do you know that . . .



A LINE OF DRUMS END TO END LONG ENOUGH TO REACH TWICE AROUND THE EARTH WOULD BE REQUIRED TO HOLD THE BILLIONS OF GALLONS OF SINCLAIR FUEL AND LUBRICANTS SOLD LAST YEAR.



SINCLAIR REFINERIES HAVE MANUFACTURED MILLIONS OF BARRELS OF 100-OCTANE GASOLINE FOR THE ARMED FORCES. SINCLAIR AVIATION GASOLINE WILL AID FLYING ON NATIONAL AND INTERNATIONAL ROUTES.



FOR BETTER DIESEL LUBRICATION—SINCLAIR PROVIDES RUBILENE AND GASCON OILS WITH NON-CORROSIVE, SLUDGE-RESISTANT QUALITIES THAT INSURE CLEAN ENGINES. TEN-OL, NEW FOR DIESEL LUBRICATION. FULLY MEETS U.S. ARMY SPECIFICATION 2-104B.

SINCLAIR IS EQUIPPED TO SERVE YOU BETTER!

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

Maintenance Work on Diesel Units in Locomotive Service

Conducted by R. L. GREGORY*

THE primary object of articles presented in this section of DIESEL PROGRESS is to discuss subjects of interest to Supervisors and Engineers alike, handling Diesel units. For the most part, in the past, we have discussed only units as applied to stationary service, but with the ever increasing use of Diesels as motive power, we feel that it is only fair to some of our readers, at least, to present problems and questions for the consideration of Supervisors and Operators of all types of Diesel units, and not confine it to stationary units alone.

The following article was sent to DIESEL PROGRESS, by Ben Samuel, Jr. of Milan, Tennessee, and since Mr. Samuel has brought up several points which should be of interest to many of our readers, we feel that his comments should be passed on, hence we quote from his letter as follows:

"During the past four years, I have had considerable experience with Diesels as applied to locomotive service, and while of smaller rating than a good many Diesel units in this type of work, they still present the usual problems found in most Diesel engine operation. These engines, like any Diesel engine must be inspected and repaired at periodical intervals. With only one reserve unit, and that of a smaller type, the Supervisor and Maintenance men must have the ability to foresee the possible minor breakdowns, make necessary repairs, in order to prevent major troubles.

"For the most part these locomotives are operated by men who are not familiar with the care necessary to any type of Diesel, therefore when an engine comes out of the shop fully repaired for its next 5,000 hours of operation it is practically on its own, outside of the weekly inspection and an oil and water check every eight hour shift.

"In the operation of these Diesels in this type of service, the engine speed is never the same for longer than a ten minute period, and the load demand on the locomotive sometimes reaches two to three hundred per cent of its rated capacity. Under such conditions it is easy to see that the engines are taking a terrific beating, but since we have these locomotives equipped with these lighter Diesels, and it has been impossible to replace them with larger units, it is up to us to maintain them to the best of our ability and keep them working under the present conditions. Now to present some of our maintenance problems in keeping these units in service.

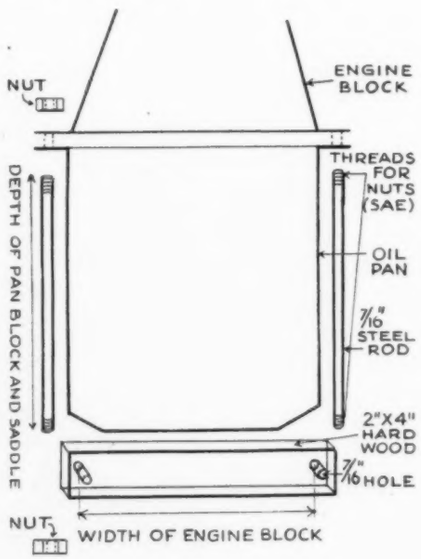


Fig. 1.

"These engines have a thin steel oil pan to cool the oil, and no other cooling device is used, although different types of coolers could be used if available. The shocks to the locomotive from some of the loads, and the resultant vibration of the engines from these loads, cause these lightly constructed pans to crack on the rear corners. We have eliminated three-fourths of this particular trouble, by means of a saddle made to go under the pan and fastened to the block. This lightens the load on the pan at the rear corners, and the saddle as we constructed it is shown in Fig. 1. If cast iron pans and auxiliary cast iron coolers could be secured most of this trouble would be eliminated completely, however the cost of specially constructed equipment would be too high to be practical, when we can eliminate most of it by the method shown.

"We have found that after these engines pass the 5,000 hour mark in operation, they begin to show up the weak spots. Under heavy operating conditions they are generally ready for new sleeves, pistons, bearings and rings. In some cases if the service has been of a lighter nature, and the operation not too severe, the sleeves and pistons will stand up for an additional 5,000 hours. However their true condition cannot be determined until they are dismantled, and micrometer readings of the parts taken; because in the type of switching service in which they are used, one 5,000-hour operation may be light, while the next like period may be very heavy. We have found that if these sleeves, or liners on this type of engine show a wear of more than .008 in. it is advisable to replace them along with corresponding pistons.

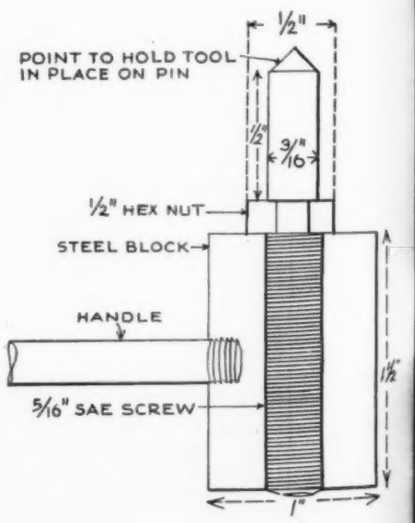


Fig. 2.

"When using the old sleeves for an additional 5,000 hour operation it is always advisable to pull the water seals, of which there are three.

. . . . *And now please turn to page 94* . . . .

* *Chief Engineer, Municipal Water and Light Plant, Hillsdale, Michigan.*

PETER MORAN
Commercial Towboat

Diesel Engines Regulated by

Marquette HYDRAULIC GOVERNORS

and OVER-SPEED TRIP GOVERNORS

The Marquette METAL PRODUCTS CO.

CLEVELAND 10, OHIO

Manufacturers of: HYDRAULIC AND ELECTRIC WINDSHIELD WIPERS FOR AIRCRAFT
HYDRAULIC GOVERNORS FOR DIESEL ENGINES • ROLLER BEARING TEXTILE SPINDLES • FUEL OIL PUMPS
AIR COMPRESSORS • PRECISION PARTS AND ASSEMBLIES

Exchange Your Diesel Maintenance Ideas

"Making Use of the Scrap Pile"

Conducted by R. L. GREGORY

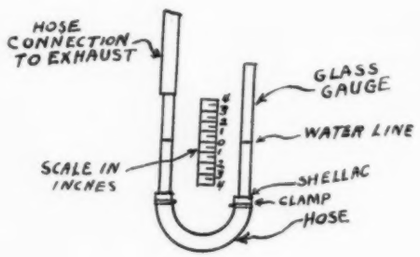
Editor's Note: In this department we provide a meeting place where Diesel and Gas engine operators may exchange mutually helpful maintenance experiences to keep our engines in top condition. Mr. Gregory edits your material and adds constructive suggestions from his own wide experience. This is your department—mail your contributions direct to DIESEL PROGRESS.

THE real maintenance mechanic is the man who studies the unit he is working upon, endeavors to find causes and so improve his work that it reflects in better maintenance practice. He is always striving to find or develop better ways and methods of accomplishing his tasks, and goes at them in a workmanlike manner. In order to accomplish this end one of his principal assets is his ingenuity. By studying and planning he often accomplishes the job that the other fellow says can't be done. Instead of throwing up the proverbial sponge as many do, when they run up against a difficult problem, the good maintenance mechanic, makes use of items and materials at hand, and eventually licks the problem, and takes pride in the fact that he has overcome it. Such a man is worth his weight in gold to any plant.

As often stated in this section, there are a great many useful items that can be constructed from odds and ends found around the scrap pile or laid away in some secluded part of the plant, which with a little ingenuity, can be constructed into some useful piece of equipment which will be a time and labor saver in plant operation. One of these is shown in the accompanying sketch forwarded to this department by M. L. Monson, Superintendent of the Fosston, Minnesota Municipal Plant. His description of it is as follows:

"Sometime ago we were interested in determining the back pressure in the exhaust lines of our Diesel Units, and felt that the same could be accomplished by use of a manometer. Having none in the plant, we decided that we could easily construct one from materials at hand. We secured two ten-inch lengths of ⅜ in. gauge glass for use as the columns. Having no immediate method or means of bending this glass to form a 'U' tube, we secured a piece of ¾ in. rubber hose to make the 'U' bend, as this hose just fitted snugly over the ends of the gauge glass.

"The ends of the gauge glasses were shellacked, before inserting the tube in the rubber hose, and then a hose clamp fastened over the hose to hold it firmly in place. The arrangement was then mounted on a board and the tubes partially filled with water, approximately half full. A scale was made and mounted as shown, between the tubes, with the water level as the 'O' point. A connection from the opposite end of one tube was then inserted in the exhaust and when open and functioning, the back pressure was calculated, it being the difference in inches between the two water levels.



We have found this gauge to be a very handy arrangement for determining this back pressure, and it has saved us a lot of time and labor in dismantling the exhaust lines to determine their condition. Manometer readings on a clean exhaust line was used as a basis for determining exhaust line conditions."

The above is just one sample of what one man did with parts from "the scrap pile." And talking of manometers, they are a handy item around any plant. A neatly constructed one, made by securing a piece of ¼ in. medicinal glass tube from any drug store, then by use of a small flame and heating about three inches in the center to a cheery red and bending it into a "U" tube, mounting it much as did Mr. Monson, makes a handy instrument. Water colored by the addition of a little red ink makes it more visible.

Such an instrument can be used on the crankcase to determine vacuum, or can be placed in the outlet of fans for determining pressure of air. One engineer even made one and mounted it on his scavenging air intake to doublecheck his scavenging header gauge.

Application and Recommended Uses of Heavy-Duty Detergent Type Engine Oils*

HEAVY-DUTY detergent oils were specifically designed and are recommended for all high-speed engines both gasoline and Diesel types. Many medium-speed Diesels equipped with a single lubrication system are using these oils where improved ring lubrication is desired. They are also suitable for the cylinder lubrication of large low-speed engines requiring greater protection against ring sticking or wear.

The successful performance of these oils in high-speed engines has naturally led to many attempts to use them elsewhere. Experience has shown however, that some caution must be exercised when extending the use of oils of this type.

Although heavy-duty detergent oils are often used for the lubrication of cylinders in large slow-speed Diesel engines, their use in the separately lubricated crankcase is limited by the oil purification equipment employed. The greater dispersion and emulsification properties of these oils tend to prevent satisfactory removal of carbonaceous material and water making it necessary to drain the crankcase oil at regular intervals in order to remove these contaminants.

This procedure although particularly desirable for the smaller high-speed engines is far too expensive and time-consuming where crankcase capacities of large engines range as high as 1500 gallons. In such installations a straight mineral oil is used to better advantage in that it can be maintained in a relatively clean condition almost indefinitely. This is accomplished by the purification system's removal of contaminants as rapidly as they are formed.

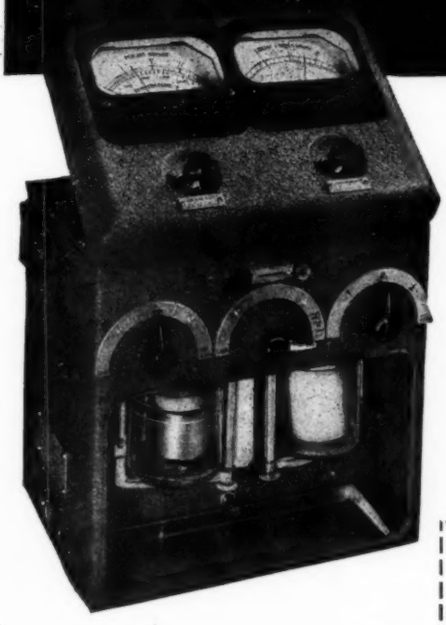
Where heavy-duty detergent oils are used in these large engines, special precautions must be taken where water-cooled pistons, mchanical lubricators and centrifuges are employed.

---

* *From The Texas Company "Lubrication."*

How efficiently are you Burning Fuel?

YOU CAN FIND OUT—IN JUST A FEW MINUTES—WITH THE CITIES SERVICE INDUSTRIAL HEAT PROVER



This unique instrument indicates simultaneously the percentage of unburned fuel, or oxygen present in the flue gases.

With this data the Cities Service engineer can show you at once how to *save* on fuel costs.

The Industrial Heat Prover has been applied with uniformly successful results to every kind of fuel and to every type of combustion equipment in this country.

Also used successfully for controlling furnace atmospheres in the heat treatment of steel.

For a demonstration of the Industrial Heat Prover on your own equipment, contact your nearest Cities Service office or mail the coupon below.

MAIL THIS COUPON TODAY

(Available only in Cities Service Marketing Territories East of the Rockies)

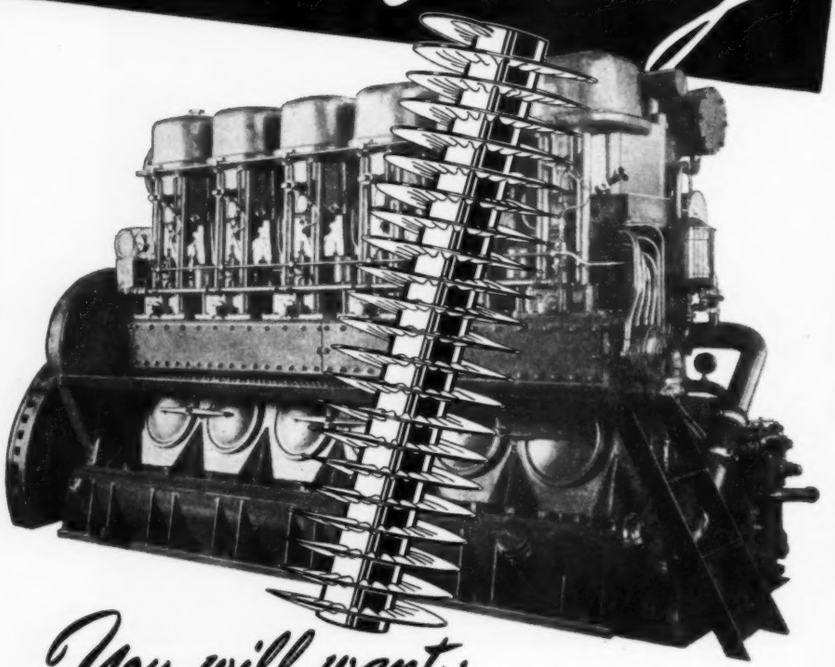
Cities Service Oil Co.
Room 441 , 70 Pine Street
New York 5, N. Y.

Gentlemen: Please send me further information on the Cities Service Industrial Heat Prover—at no obligation to me.

Name .....
Title .....
Company .....
Address .....
City ..... State .....

CITIES SERVICE OILS
ONCE-ALWAYS

If You Are Interested in *Diesel Cooling*



You will want:

1. High Efficiency of Heat Transfer
2. Compact, Adaptable Design
3. Rugged Construction

AEROFIN gives you all three PLUS Dependability, backed by twenty-two years of pioneering in heat exchange surface.

Outline your requirements to our engineers

AEROFIN CORPORATION

410 So. Geddes St., Syracuse, New York
Dept. D10

Chicago • Detroit • Cleveland • New York
Philadelphia • Dallas • Toronto

Legal News, *continued from page 80*
first, the balance split as aforesaid." The contract did not state when the July 1 contract would terminate, nor did it state its duration, nor whether it was an employment or a partnership agreement.

Nash wrote individual letters to counties, highway districts, and some cities. He contacted some two thousand different firms in the country and business was received from twenty-five different states. Also, Bertram wrote letters and called on prospects. In the meantime, after the expenses of conducting the business were deducted, the profits were divided 60% to Bertram, and 40% to Nash. At the end of approximately 18 months Bertram wrote a letter to Nash advising him of the termination of "all agreements existing either oral or written."

It is interesting to observe that the lower court held the contract one of employment and allowed Nash payments only to the date the contract was terminated by Bertram. The higher court approved the verdict, saying:

"The contract was one of employment and not a partnership; under the contract, appellant (Bertram) had the right, at any time, to discharge respondent (Nash) and terminate the contract."

Unfair Competition

Any person, firm or corporation may be guilty and liable for "unfair competition" if the testimony indicates that any part of a trade-mark or trade-name appropriated is likely to confuse the public.

For illustration, in Atlas Diesel Engine Corporation v. Atlas Diesel School, 60 F. Supp. 429, reported July, 1945, the Atlas Diesel Engine Corporation sued the Atlas Diesel School, Inc., for injunctive relief against using the name "Atlas" or "Atlas Diesel" in connection with any business associated directly or indirectly with internal combustion engines or in connection with any servicing of such engines.

During the trial testimony was given which proved that the Atlas Diesel Engine Corporation is a corporation organized under the laws of the State of New York, and is a subsidiary of Atlas Imperial Diesel Engine Company, which, also, has other subsidiaries in different states.

The business of Atlas Imperial Diesel Engine Company is the manufacturing, selling, repair-

. . . . *And now please turn to page 90* . . . .

An outstanding performer, viewed from every angle

This new engine, direct connected to a 500 kw. generator, will be used for auxiliary power in a Navy AR repair ship. Just one of many responsible jobs where the ability to deliver dependable power under severe service conditions is a Number One requirement.

In all types of service, the sound engineering and sturdy qualities of Baldwin Diesels are reflected in high efficiency, maximum availability, and minimum repairs. When you need a Diesel, check the Baldwin line; there's a type and size for almost every need.

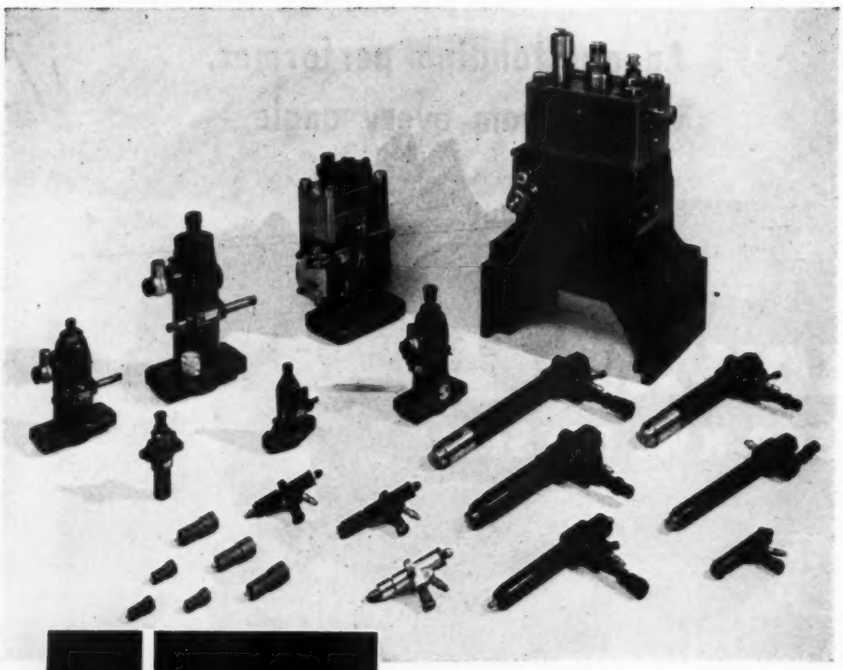
The Baldwin Locomotive Works, Locomotive and Ordnance Division, Philadelphia 42, Pa. Offices: Philadelphia, Chicago, St. Louis, Washington, New York, Boston, San Francisco, Houston, Cleveland, Detroit, Pittsburgh.

BALDWIN PRODUCTS

Locomotives, Hydraulic presses, Testing equipment, Steel forgings and castings, Diesel engines, Metal plate fabrication, Rolled steel rings, Bronze castings, Ship propellers, Marine steering gear, Heavy machine work, Crane wheels, Bending rolls, Plate planers, Babbitt metal, Alloy iron castings, Briquetting presses.

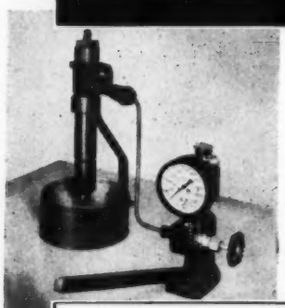
BALDWIN

DIESEL ENGINES



adeco...

YOUR SOURCE FOR DEPENDABLE FUEL INJECTION EQUIPMENT



Whether you need standard fuel injection equipment or special units built to your specifications, Adeco offers the logical source of supply.

Today's line of Adeco equipment, the outgrowth of long experience in serving the Diesel industry, includes: Standard fuel injection pumps in plunger diameters from 7 mm. to 31 mm.; a complete line of standard nozzles and nozzle holders, including the water-cooled type; and the Adeco nozzle tester.

All Adeco products are built to highest standards, with years of trouble-free operation behind them to testify to their reliability.

ADECO NOZZLE TESTER

For Low-Cost Maintenance

America's most widely used nozzle tester enables any mechanic to make quick, accurate tests on injector opening pressure, spray pattern, etc., and detect stuck needle valves and leakage around valve seats. Compact, portable, sturdy, precision-built. Pressures up to 10,000 p.s.i. Tests both large and small injectors on bench or engine. Prevents costly delays and possible damage to engine. Standard or Navy-approved gauge. Ideal for testing hydraulic equipment. Write for bulletin.

ADECO

AIRCRAFT & DIESEL EQUIPMENT CORP.

4401 NO. RAVENSWOOD AVE. • CHICAGO 40, ILLINOIS

Legal News, *continued from page 86*

ing, rebuilding and servicing of Diesel engines. The business of Atlas Diesel Engine Corporation and Atlas Engine Company is the selling, repairing and servicing of Diesel engines. The business of Atlas Diesel School, Inc. is training Diesel engine mechanics and Diesel engine operators in the art of servicing, repairing and rebuilding, and operating Diesel engines.

Atlas Diesel Engine Company is the direct successor of the Atlas Gas Engine Company and the Imperial Gas Engine Company which companies were in the business of manufacturing and selling internal combustion engines as early as the year 1905. Atlas Imperial Diesel Engine Company and its predecessors have used the trade-mark and trade-name "Atlas" on internal combustion engines. Atlas Imperial Diesel Engine Company was a pioneer in the field of manufacture of Diesel engines, and since some time prior to November 9, 1927, it has engaged almost exclusively in the manufacture, sale, servicing, repairing, and rebuilding of Diesel engines throughout the entire United States of America, its territories and possessions and throughout many foreign countries.

The money spent in advertising by Atlas Imperial Diesel Engine Company, for the past ten years, in sales promotion of its products, exceeded the sum of One Million Eight Hundred Thousand Dollars ($1,800,000). Its annual sales of Diesel engines, under trade-mark "Atlas" and parts thereof, for the past ten years amounted to a sum in excess of Thirty-one Million Dollars ($31,000,000), not including accessories sold in connection with the engines.

"It is hard to understand how defendant (Atlas Diesel School) and its officers could have embarked in the business of training men to service Diesel engines in the industry without knowledge of the plaintiff (Atlas Diesel Engine Corporation) and their place in that industry and their use of the name 'Atlas' and 'Atlas Diesel.' But, giving to the testimony of defendants' officers full faith and credit, such innocence of any intentional wrongdoing cannot serve as a basis for the continued use of the name 'Atlas' and 'Atlas Diesel' . . ."

The higher court held:

"Defendant's (Atlas Diesel School's) use and appropriation of plaintiff's trade-name 'Atlas Diesel' by the inclusion thereof in defendant's name 'Atlas Diesel School, Inc.,' constitutes an act of unfair competition for which plaintiffs (Atlas Diesel Engine Corporation) are entitled to relief."

Miles Young

Any number of GMC coaches powered with General Motors Diesel engines have passed the million-mile mark. And they're still going strong. Still pulling upgrades smoother—still faster on the get-away—still turning in upwards of 50% more miles per gallon of low-cost fuel.

One reason is the GM "71" 2-cycle Diesel engine that packs big, tough horsepower into small space and light weight.

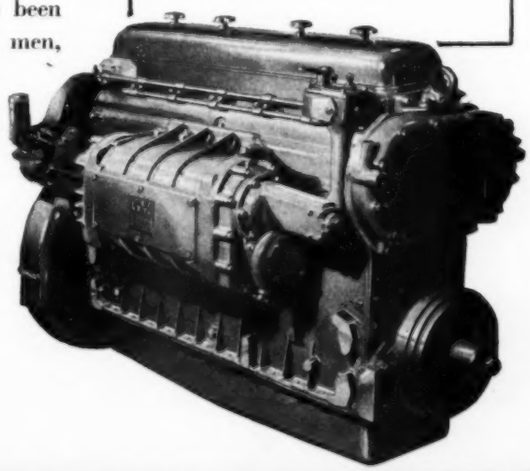
Coaches are just one example. These sturdy power plants hand out performance like this everywhere they're used—in tractors, boats, trucks, cranes—driving oil-well machinery, lumber saws and cotton gins.

All through the war GM Diesels have been working side by side with our fighting men, powering landing craft, tanks, tractor bulldozers and all kinds of hard-working machinery.

And as these boys come home, these engines will still stand ready to work side by side with them—ready to provide rugged, long-life, low-cost, easily maintained power in the countless applications of America's expanding industry.

FEATURES OF THE GM "71" DIESEL

- ★ Low size and weight per horsepower
- ★ Quick starting under all conditions
- ★ 2-cycle, smoother operation
- ★ Easy accessibility of wearing parts
- ★ Unit injectors—no high-pressure piping
- ★ Maximum parts interchangeability regardless of number of cylinders
- ★ Uniflow scavenging—clean burning
- ★ Smooth performance at high altitudes



GM
GENERAL MOTORS
DIESEL POWER

KEEP AMERICA STRONG—BUY VICTORY BONDS

RELIABLE . . . readable

EVEN IN THESE *Rough Places*

WESTON THERMOMETERS

are ALL-METAL for ALL-ROUND ruggedness!

In tough spots like these, and many others too, *Weston All-Metal Industrial Thermometers* withstand shaking up without breaking down. Even the severe vibrations of pumping units or Diesel engines do not affect the long-term stability of Weston Thermometers.

Basic to their *all-round ruggedness* is an all-metal construction that insures sustained accuracy (within 1% full-scale) over long periods of time. There are no liquids, gases, capillaries or other troublesome parts. Simply an all-metal temperature element safely sheathed in a rugged stainless steel stem.

Weston All-Metal Thermometers are available in scale lengths 6", 9", 12" . . . stem lengths from 2½" to 48" . . ranges from — 100°F to + 1000°F. Literature gladly sent on request . . . Weston Electrical Instrument Corporation, 579 Frelinghuysen Avenue, Newark 5, New Jersey.

Weston *All Metal* THERMOMETERS

Supervising, *continued from page 82*

and replace them, since they deteriorate when the hot detergent oil hits them, and as a result of this deterioration, water will begin to seep into the oil pan; and if not repaired immediately an unlimited amount of bearing and crankshaft trouble ensues. In replacing these water seals we have found that a coating of white lead holds the seal longer than any other materials tried. In four years of supervision over these engines, I have never experienced a bad intake or exhaust valve, since we keep the valve tolerance at from .018 to .022 in.

"We have also found that the fuel system on these engines will stand up as long as other parts of the units with occasional injector cleaning and setting, approximately every 1,000 hours. However the pumps should be rebuilt every 5,000 hours when the engines get their major overhaul. If a man is not available who is thoroughly familiar with these pumps, they should be sent to the factory for reconditioning, in which case it is always advisable to have spare pumps on hand. As a rule I, personally, take over the repair of these pumps and put them in first class condition, by purchasing a few pump part assemblies, so as to eliminate a metering and rpm. check, since the governor is built in the fuel pump on this type of unit.

"We have also experienced some difficulty with the pressure pump drive pin. This is located in the end of the main shaft, and has only the fuel as a lubricant, which is not sufficient lubrication to keep it from wearing rapidly. Some of these pins have sheared off and in order to replace them, it is necessary to remove the main shaft from the pump, which takes a considerable amount of time. If the conditions are such that the locomotive can be pulled out of service for a time, a small tool can be made to remove the pin on the pump without dismantling or removing the pump from the engine. All that is necessary is to remove the pressure pump and press the pin out with this tool, as shown in Figure 2. This tool is made to set on the bottom of the pump housing and press against the pin, which is then removed. The approximate itime required to make this repair is thirty minutes and without this tool it would otherwise require five to six hours.

"The fuel and oil lines are located on the outside of these engines. These should be thoroughly braced to eliminate breaking at the flare line of the ferrule. When these lines get old the material crystallizes and unless they are properly braced and tightened the lines will

. . . . *And now please turn to page 98* . . . .

ANOTHER WORTHINGTON FIRST

★SUPERCHARGED★

DUAL-FUEL ENGINE

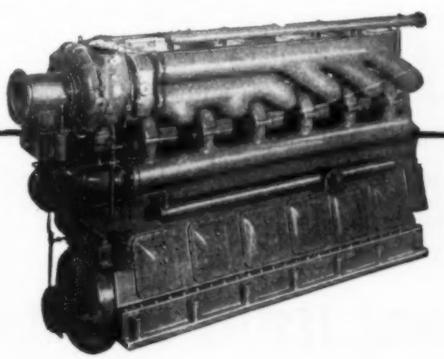
Worthington . . . builder of the first American designed solid injection, compression ignition Diesel engine . . . builder of the first American double-acting Diesel . . . the first American 4-cycle dual-fuel engine . . . now announces an outstanding achievement in engine history, the first *supercharged* 4-cycle dual-fuel engine.

Worthington's Dual-Fuel Engines, result of years of experimentation and testing, are instantly convertible from gas to oil, and back again, by the turn of a wheel . . . operate on any proportion of oil and gas, from 5% oil and 95% gas to fuel oil only . . . and are on order and in production today.

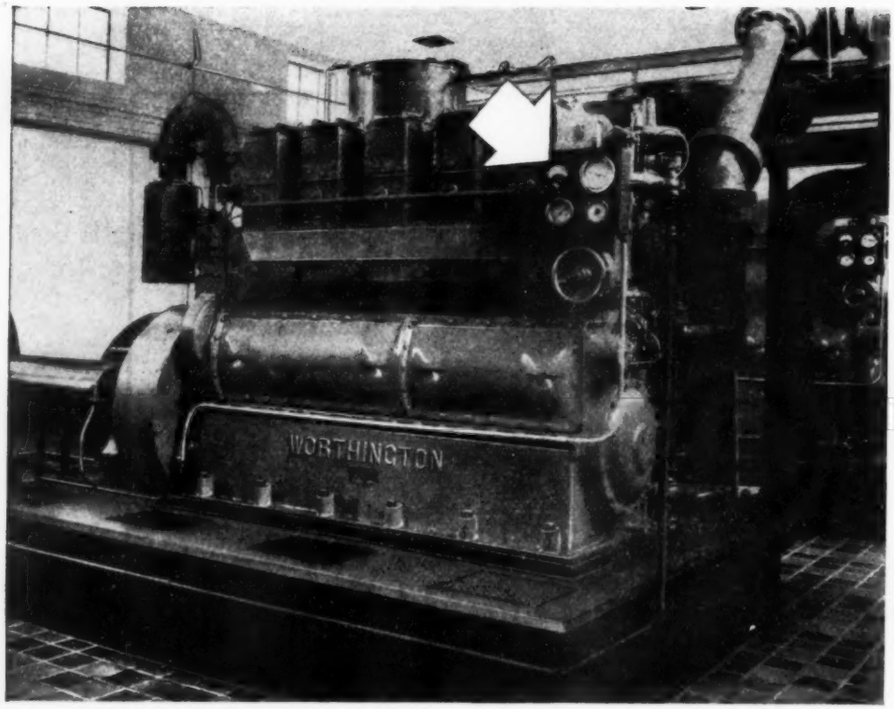
Now . . . another step forward . . . *supercharging* makes possible in a dual-fuel engine the same high thermal efficiencies previously obtained only in supercharged oil Diesels.

Worthington Pump and Machinery Corporation, Buffalo Engine Division, Buffalo, N. Y. Diesel engines, 150 to 3,290 hp . . . Gas engines, 175 to 3,500 hp . . . Dual-Fuel engines, 150 to 3,290 hp.

YOUR PARTNER IN POWER PROGRESS



WORTHINGTON



Alnor Pyrometers . . .

a dependable guide to dependable engine performance

These Worthington gas engines drive centrifugal pumps in a mid-western sewage treatment plant and operate on sludge gas. As in so many other installations of Diesel and gas engines, where dependable service is paramount, you will find Alnor Exhaust Pyrometers on the instrument board. These reliable instruments provide for a quick, accurate, routine check of exhaust temperatures as a guide to efficient operation, maintenance, and adjustment.

Alnor Pyrometers are built in a complete range of types and sizes, single and multi-point, to meet the needs of installation with any type of engine. Write for special exhaust pyrometer bulletin with complete descriptions.

ILLINOIS TESTING LABORATORIES, INC.

420 North La Salle Street

Chicago 10, Illinois

Supervising, *continued from page 94* frequently break. We usually install new ones when the engines have operated for a 5,000 hour period.

"We sometimes experience trouble with the oil pressure falling off as a unit approaches the 5,000 hour operating mark. If the oil pressure drops below 25 lbs. it should be raised. The lube oil pipes that feed the upper and lower rocker assemblies have a drilled passage that can easily be made smaller by means of an orifice, thus raising the pressure and at the same time supply ample oil for the rocker assemblies. The time required to install this orifice is very short compared to that required for rebushing upper and lower rocker assemblies.

"We have no trouble with the rod and main bearings when proper bearings are used and properly installed. These bearings are of the precision type and no fitting is necessary. We have found that a copper-lead bearing will stand up longer and give better service than any other type, and we make it a rule to replace all rod, main and camshaft bearings, as well as all bushings which are pressure fed after a 5,000 hour service operation."

Agency To Study Resources of the West

TRANSAMERICA Corporation, owner of Enterprise Engine & Foundry Company and General Metals Corporation, has appointed West-Marquis, Inc., Pacific Coast public relations agency, to conduct a survey of the economic resources of the Far West, it was recently announced by James F. Cavagnaro, Senior Vice President.

"Decision to make an exhaustive survey of the economic status of the West resulted from the realization that the greatest migration of commerce and population in the recent history of the United States is now taking place in the Far West," Cavagnaro stated.

"We believe that the facts, when exposed to Western business and the general public, will stimulate optimism and courage for all interests dependent upon the economic future of the Far West. Since its inception, Transamerica Corporation has been rooted in and irrevocably dedicated to the future growth and prosperity of the West. We believe that Western business and the general public are entitled to know why we place so much faith and confidence in the future of the Far West, and for that reason it is planned to make the results of the current study available to the public," he concluded.

PRECISION PROGRESS

When the chips were down and the manufacture of precision parts was essential to the prosecution of the war, our large force of engineers and craftsmen developed and produced a myriad of aircraft engine parts. In the world of tomorrow when the production of quality duplicate parts can mean your progress, Lawson Precision manufacture will accelerate and help achieve your goal.

Forged Inclusion Connecting Rod manufactured for Pratt & Whitney aircraft engines.

PRECISION Lawson

ARMY E NAVY

LAWSON MACHINE and TOOL CO

120 MOUNTAIN AVENUE, MALDEN 48, MASS.

W. J. Maddox* Reports On Surplus Engine Situation

WASHINGTON.—Currently the U. S. Maritime Commission has on hand about $5,000,000 —cost to the Government—worth of new Diesel engines that have been declared surplus property and that it is offering for sale at a total listed price of $3,500,000. Less than half a dozen used Diesels are available at the moment through the Commission, and although they have been reconditioned are said to be in very poor shape.

These engines have come from various Government agencies, but up to date the Navy has not been in a position to declare its surplus Diesels. When it does, however, they will be turned over to the Maritime Commission for sale. The Navy will do no selling itself.

Navy's reticence in talking surpluses is due to the uncertainty regarding its post-war size. Until Congress decides on how big the peacetime Navy will be, no one can say just what of the present wartime stocks of equipment can safely be turned loose.

Most of Navy's Diesels are in landing craft, and it was Navy's policy during the war to maintain a large stock of replacements. Shops at many bases in the Pacific were kept busy reconditioning beaten engines to replace others as they were removed from the ships. Navy, of course, will not keep in commission all the landing craft it now has. Many of these will have to make way for improved types and total number undoubtedly will be reduced, depending on how deep a cut Congress takes in getting the Navy down to a peacetime basis. But whatever landing craft Navy keeps will need a large stockpile of Diesels for replacement purposes.

Policy of the Maritime Commission generally is to dispose of the Diesels under fixed prices that are established at fair market levels for individual users, dealers, wholesalers, exporters, manufacturers and the Government. Items are priced on an "as is, F.O.B. location" basis, and other than normal precautionary packing charges must be defrayed by the purchaser.

As with the other surplus property the Commission sells, the engines are available first to the priority purchasers of U. S. Government agencies and State and local governments, as provided in the Surplus Property Act of 1944. If a claim on the material is not made by any of these priority buyers within 30 days after it is listed, the item is offered for sale to the public.

The Commission sells nothing by bid. It puts a price on an item—and sticks to it. There's no negotiating. However, if the item doesn't move at the price set on it, officials are ready to listen to suggestions. A list of the new Diesel engines now offered for sale to the public is currently issued by the U. S. Maritime Commission, Surplus Property Division, Washington, D. C.

---

* *Chief of DIESEL PROGRESS' Washington Staff.*

NEW ROSS TRIPLEX OIL COOLER

REDUCES AIR-COOLED RADIATOR SURFACE AND CAN BE INSTALLED ANYPLACE IN *DIESEL LOCOMOTIVES*

With the new Triplex Cooler, Type "BCF", Ross introduces a shell and tube type unit embodying features heretofore unavailable for positive cooling of lube oil in Diesel Locomotives.

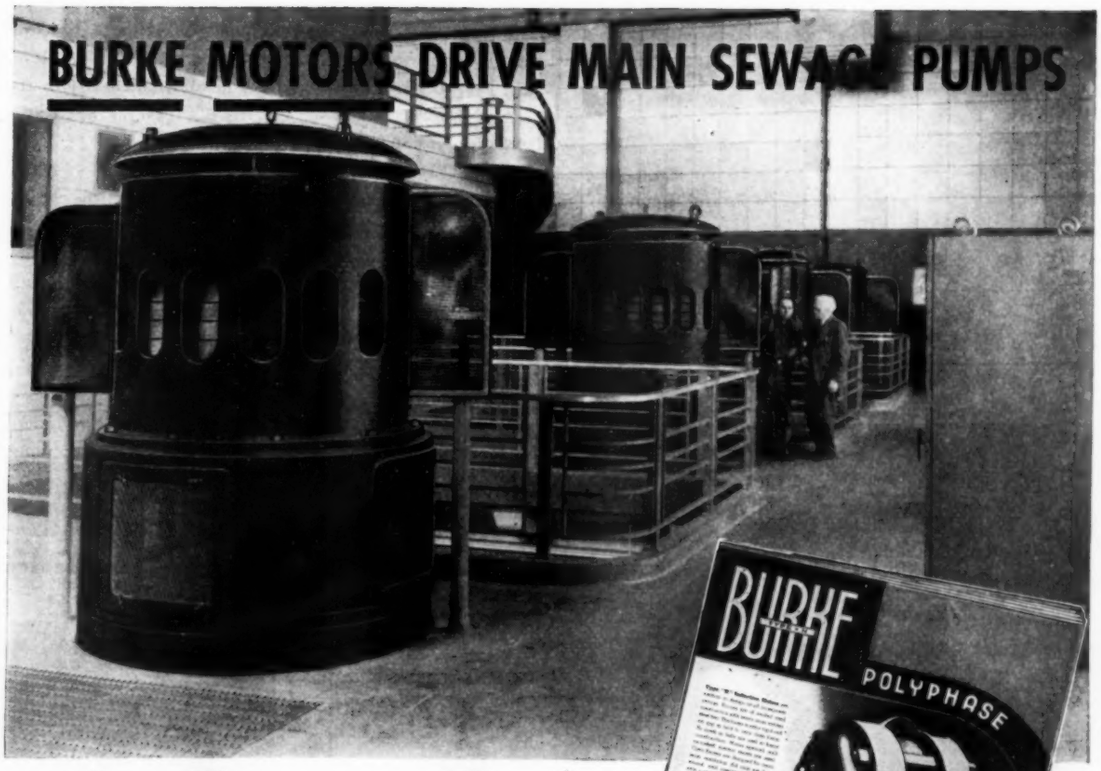
(1) Specifically designed to accommodate the limited space in locomotives, it substantially reduces the total radiator surface. (2) Unlike the radiator type oil cooler, it need not be accessible to the air, but can be installed in any location. (3) Structurally strong to withstand vibration. (4) Increases cooling efficiency—has a higher transfer rate than possible with the oil-to-air system.

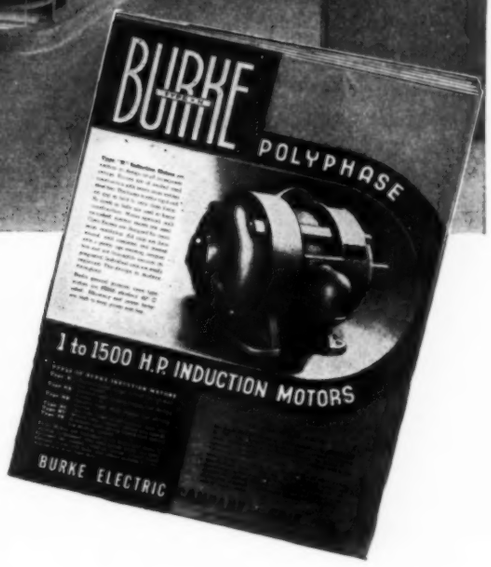
With more than 25 years' background of shell and tube heat exchanger manufacturing, and with an unmatched record of furnishing coolers to over 81% of the Diesel engine builders, Ross' experience is ideally suited to the Diesel locomotive field. Consult Ross engineers on sizes for every type locomotive.

ROSS HEATER & MFG. CO., INC.
Division of American Radiator & Standard Sanitary Corporation
1425 WEST AVENUE BUFFALO 13, N. Y.

Get to know this button.

BURKE MOTORS DRIVE MAIN SEWAGE PUMPS





At Bowery Bay

NEW YORK CITY'S MODERN, ACTIVATED-SLUDGE, SEWAGE TREATMENT PLANT

BURKE MOTORS perform one of the most important functions in this new plant, that of driving the main pumps which deliver the raw sewage from the incoming lines to the treatment process.

Dependable - - efficient - - rugged describes these motors. Dependable - - for continuous trouble free service. Efficient - - for low operating cost. Rugged - - for long life.

These motors are - - Wound Rotor, adjustable, varying speed-vertical type with welded steel frames, oil lubricated ball bearings, solid shafts, drip proof covers and high ring bases. Stators are designed for operation on 208 volt, 60 cycle, 3 phase power supply.

The two motors in the foreground are 400 HP at 400 RPM while the two motors in the background are 200 HP at 600 RPM. Motor speeds are varied between 85 and 100 percent to maintain the most efficient suction head on the pumps. Motor speed controls are automatically actuated by a wet well float.

Burke builds all the type and sizes of polyphase induction motors from 1 to 1500 HP. We have a background of over 54 years of specialized motor experience enabling us to make sound recommendations. Write for booklet 101-A to get acquainted with Burke induction motors, and send us your next motor problem.

5510 West 12th

MOTORS 1 TO 1500 H. P. · GENERATORS 1 TO 1000 K. W.

BURKE A.C. & D.C. Motors & Generators

BURKE ELECTRIC COMPANY, ERIE, PENNSYLVANIA · Since 1891

Navy To Give Up Diesel School At Raleigh

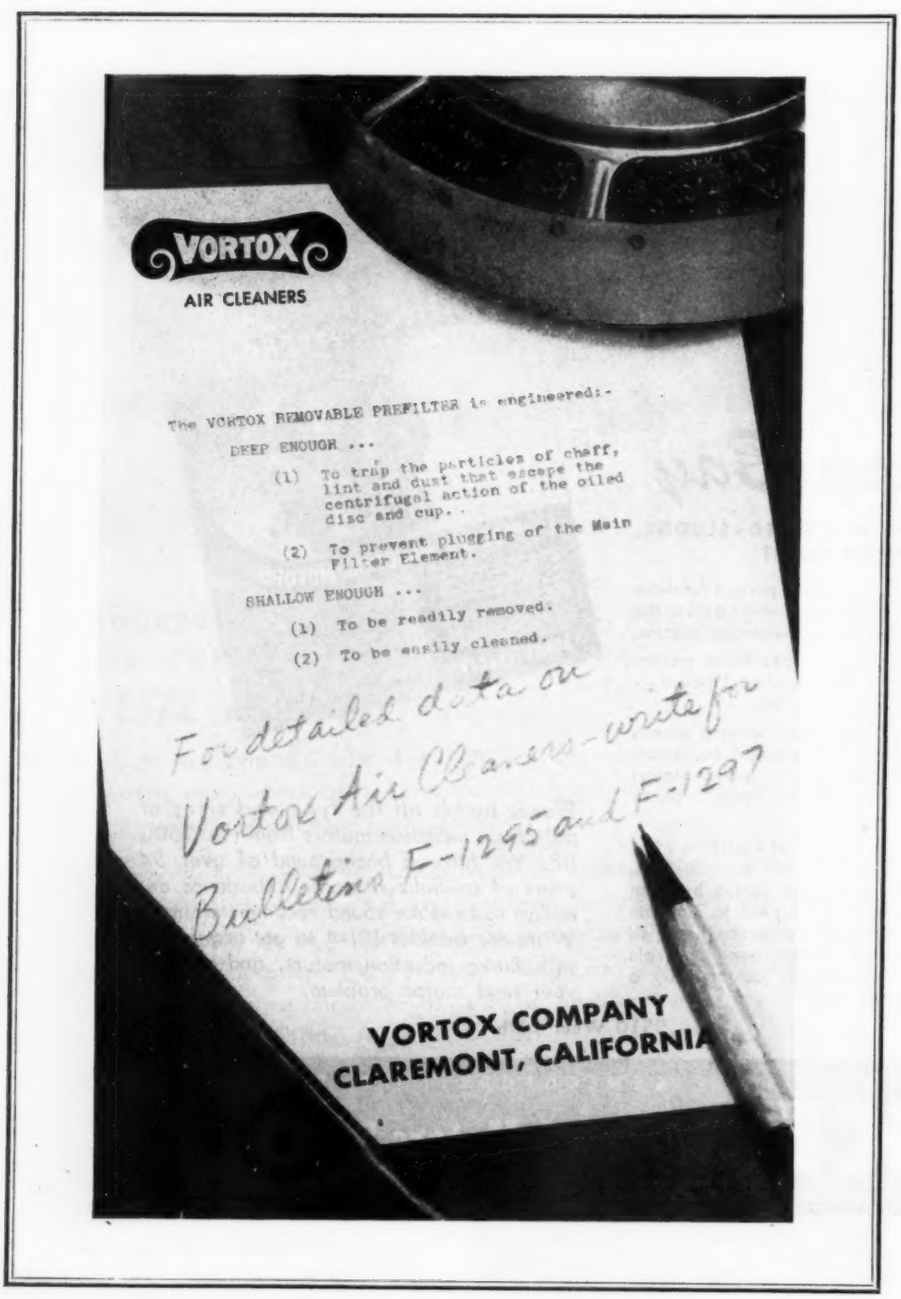
THE Diesel Engineering School at North Carolina State College, Raleigh, N. C., regarded as one of the most complete laboratories and schools of its kind in the world, will be discontinued by the Navy on December 29, according to an announcement just made by the Navy Department.

Prof. Robert B. Rice, the college's director of Diesel engineering, said that the school probably in the future will provide Diesel engineering training to civilian students if the demand exists, and that an experimental program with the engines probably will be continued.

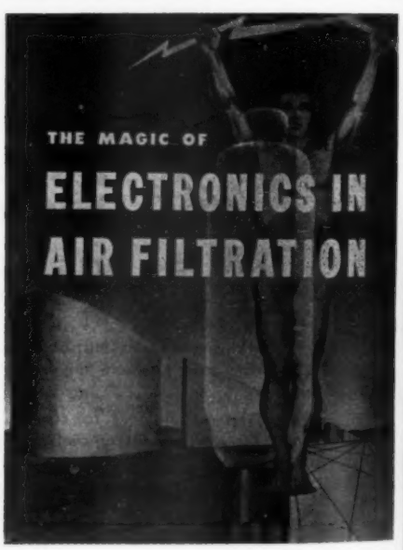
Housed in one of the most modern buildings on the campus, the school is equipped with more than $2,000,000 worth of Diesel engines, from the smallest to the largest installations. It has trained more than 1,300 Naval officers for the operation and maintenance of Diesel installations in Naval vessels other than landing craft, such as submarines, destroyer escorts, mine craft, patrol craft, and auxiliaries.

On January 8, 1941, the college began a course in Diesel engineering sponsored by the United States Office of Education, and conducted through the college's Extension Division and Department of Mechanical Engineering. The Navy became interested in the course and on March 31, 1941 the first class of Naval officers reported.

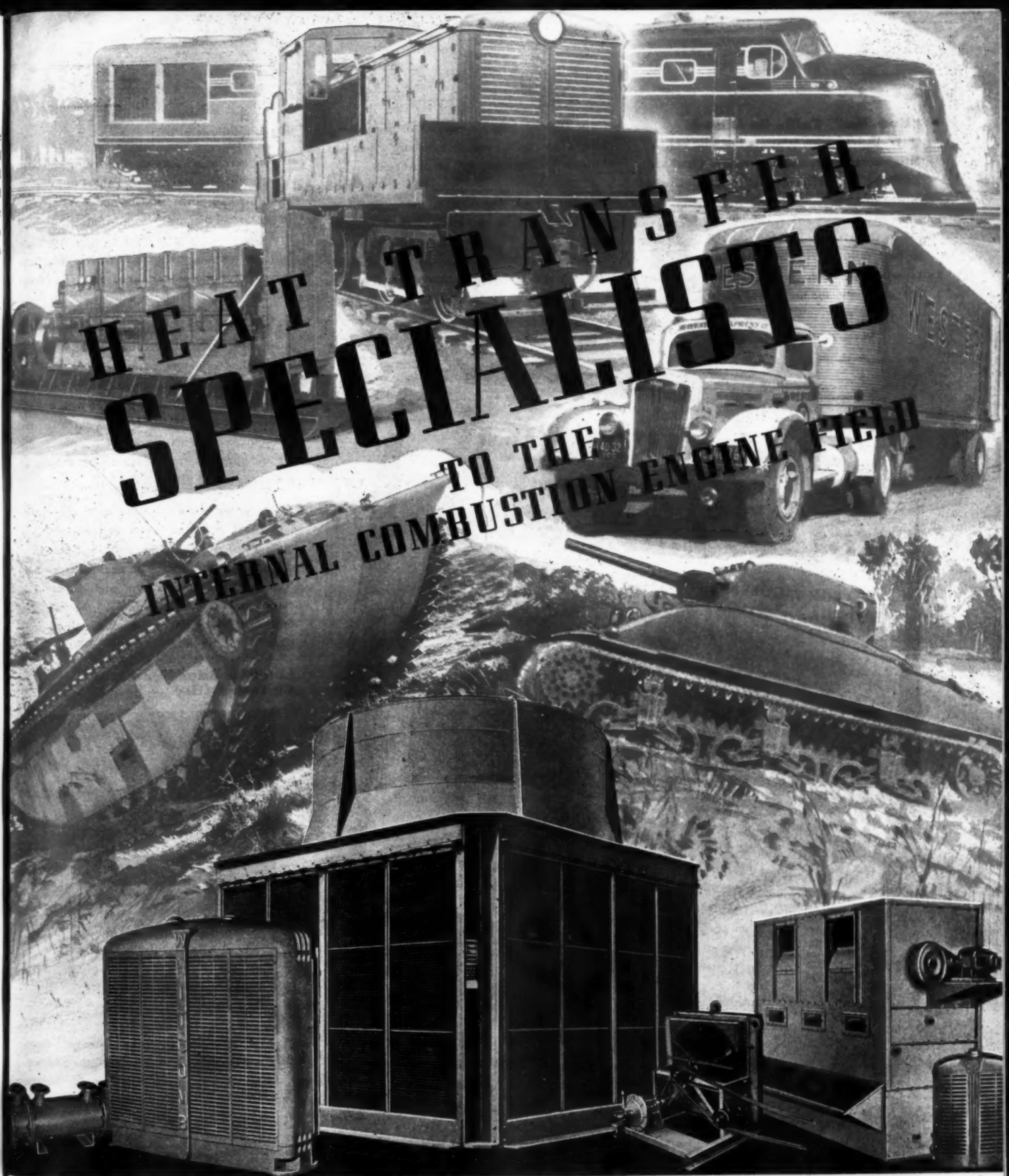
The course gradually expanded until a building to house the growing facilities and personnel was needed. The State of North Carolina allocated $200,000 from the State Emergency Fund for the construction of the modern three-story structure now housing the school, the building being dedicated on May 26, 1944. The school at N. C. State is one of two of its kind in the nation, the other being located at Cornell University. Lt. Commander John Smith has been in charge of the Navy's program at the school.


VORTOX
AIR CLEANERS
The VORTOX REMOVABLE PREFILTER is engineered:-
DEEP ENOUGH ...
(1) To trap the particles of chaff, lint and dust that escape the centrifugal action of the oiled disc and cup.
(2) To prevent plugging of the Main Filter Element.
SHALLOW ENOUGH ...
(1) To be readily removed.
(2) To be easily cleaned.
For detailed data on Vortox Air Cleaners-write for Bulletins F-1295 and F-1297
VORTOX COMPANY
CLAREMONT, CALIFORNIA

"The Magic of Electronics in Air Filtration"



CARRYING the above title, a new 20-page booklet has just been published by the American Air Filter Company, Inc. The earliest history of electronics is briefly outlined and then the book launches into a thorough treatment of the theory and practice of electronics in air filtration, with many illustrations in three colors. It shows how the application of basic electronic principles may result in superclean air which is highly desirable in many branches of industry. This interesting and informative book is non-technical and may be enjoyed by anyone—it is essentially educational—not a sales bulletin. You may secure a copy by writing American Air Filter Company, Inc., Louisville 8, Kentucky.



Changes come fast in the diesel field. New ideas replace old, and make new problems in heat transfer. For more than a quarter century, Young engineers have worked with internal combustion engineers, solving new problems as they came. That's why Young stands ready now with the experience, "know how", and manufacturing facilities to design and produce special or standard heat transfer units for every need.

YOUNG
HEAT TRANSFER PRODUCTS

Oil Coolers • Gas, Gasoline, Diesel Engine Cooling Radiators • Intercoolers • Heat exchangers • Engine Jacket Water Coolers • Unit Heaters • Convectors • Condensers • Evaporators • Air Conditioning Units • Heating Coils • Cooling Coils • And a Complete Line of Aircraft Heat Transfer Equipment.

YOUNG RADIATOR COMPANY • Dept. 235K • RACINE, WISCONSIN, U. S. A.

DISTRIBUTORS: The Happy Company, Drawer 770, Tulsa 1, Oklahoma • A. R. Flourney Company, 609 S. Grand Avenue, Los Angeles 14, California • Wrightston-Campion, New York, N. Y. • C. H. Bull, San Francisco, California • W. P. Nevins Co., Chicago, Ill. • Calmes Engineering Co., New Orleans, Louisiana • EXPORT: Amoresco, Inc., New York, N. Y.

"Boss Ket" Talks On Diesels

THE Diesel engine is as yet the most efficient prime-mover ever designed, asserts Charles F. Kettering, vice-president and general manager of the General Motors research division.

"If in the World of Tomorrow, we are going to have railroads, trucks, busses, marine transportation, power machinery and tractors, let us not underestimate the Diesel engine," he said in a recent radio talk.

"The Diesel engine has worked for us in peace, fought for us in war—it will surely help us build a brilliant future," he predicted.

As guest speaker August 26 on "Your America," the Union Pacific railroad's Mutual network program, Mr. Kettering traced the early beginnings and development of the Diesel up through the war period, when manufacturers in the industry made over 50 million horsepower for the armed forces.

His talk follows in part:

If you were to go through the Bryant and May Museum of Fire-Making Appliances in London, you would see three fundamental ways of starting a fire: First, by friction—that is, rubbing dry sticks together, as used by the American Indians; second, by sparks from a flint, the principle of the old-fashioned tinder-box; and third, by compressing air.

This last method came from the Malay Peninsula where it has been used for hundreds of years. The apparatus consists of a piece of hollow bamboo stem about six inches long into which is fitted an air-tight plunger with a piece of dried moss on the end. The native strikes the plunger with his hand, this compresses the air and raises the temperature high enough to ignite the moss.

A little over 70 years ago, a 14-year-old schoolboy looked at a glass model of this device in a museum in Augsburg, Germany, and saw in it more than a curiosity. The next year this boy, Rudolf Diesel, decided on engineering as a career, and 20 years later, in 1893, he tested his first engine using the compression-ignition principle of the fire-tube.

IT'S NEW
HELIXHAUST
WATER-COOLED
MANIFOLD
FOR MODERNIZING YOUR 4 CYCLE DIESEL
BY TURBO SUPERCHARGING
This is what's inside! Helical baffles make four independent exhaust passages
● Helixhaust water cooling reduces temperature of exhaust gasses and protects turbocharging. Makes engine room livable. Increases permissible supercharged rating of Diesel engine. It's simpler, neater, more attractive than any other . . . and it's competitive in price. These are only a few of the reasons why you should install Helixhaust Water-Cooled Manifolds. Write Stewart for more information about this efficient manifold as well as Intake Manifolds, Water Inlet Headers, and Water Discharge Pipes.
One half of a 4 passage Helixhaust for 8 cylinder Diesel.
FABRICATED BY STEWART
Stewart
FABRICATORS OF
IRON · STEEL · WIRE
THE STEWART
IRON WORKS CO., INC.
1281 Stewart Block
Cincinnati, Ohio

Linehan Joins Penn's Chicago Office

Lester D. Linehan

R. H. LUSCOMBE, sales manager, Penn Electric Switch Co., has announced the addition of Lester D. Linehan as sales engineer for the company's Chicago office. Linehan will work with E. B. Maire, manager of Penn's Chicago branch.

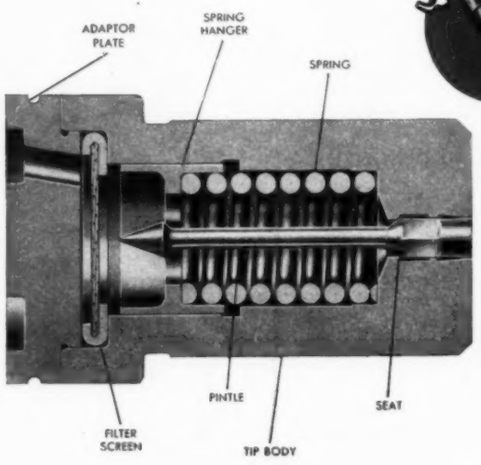
Educated at the University of Illinois and Armour Institute of Technology, Linehan was a heating sales engineer for 15 years for the Peoples Gas Co. in Chicago. Previous to joining Penn, he was a field engineer for two years with U. S. Electrical Motors, Inc.

No Adjustments Necessary..WITH THE EX-CELL-O NOZZLE TIP

FOR DIESELS FROM 5 to 300 H. P.

EX-CELL-O XLO

• Factory calibrated and sealed, the Ex-Cell-O nozzle tip assembly for high speed Diesels contains all the working parts and no adjustments are necessary. However, when field service is required, no special tools or test equipment are needed, for the operator simply replaces the tip assembly in the holder. Further, the Ex-Cell-O nozzle tip is interchangeable in holders other than the Ex-Cell-O holder. *Write today for bulletin describing Ex-Cell-O Fuel Injection Equipment.*



Fuel Injection Division

EX-CELL-O CORPORATION ☆ ☆ DETROIT 6, MICHIGAN

New Gulf Oil Booklet

A NEW booklet titled, "The Lubrication of Automotive Diesel Engines," was recently published by Gulf Refining Company. To call this book outstanding is an understatement. It contains 50 attractive pages of easy-to-read text with dozens of clear-cut color illustrations packed with down-to-earth facts about the care and maintenance of automotive Diesels from the standpoint of lubrication. Truck and bus operators, tractor and boat owners, lubrication engineers and many others will find this one of the most interesting and helpful books on this subject they have ever come across, and Gulf Oil Corporation, Gulf Building, Pittsburgh, Pa., will be glad to mail copies to all who request them on their business letterhead.

New Thermal Efficiency Record by Gas-Diesel Engine

A NEW world record in engine thermal efficiency has been accomplished by a Cooper-Bessemer turbocharged Gas-Diesel engine. The new record thermal efficiency is in excess of 40 per cent, as announced by Edmund Frederick, assistant chief engineer. "This is higher than any thermal efficiency record ever accomplished by a steam, gas, gasoline, gas turbine or Diesel engine," Mr. Frederick said.

"When it is considered that the best thermal efficiency of an automobile gasoline engine is not greater than 25 per cent, and various other types of steam, gas and gas turbines are much lower, some idea of the importance of this new achievement can be realized," he added. The highest thermal efficiency ever claimed for a gas turbine engine is only 29 per cent.

"The new world record of engine thermal efficiency was attained during routine tests on one of the company's regular Type JS engines, which carried all of its own auxiliaries."

Operation at more than 40 per cent thermal efficiency makes the Gas-Diesel the most efficient engine in operation today. The best record, heretofore, was established by the Diesel engine, which usually operates between a range of 32 and 36 per cent.

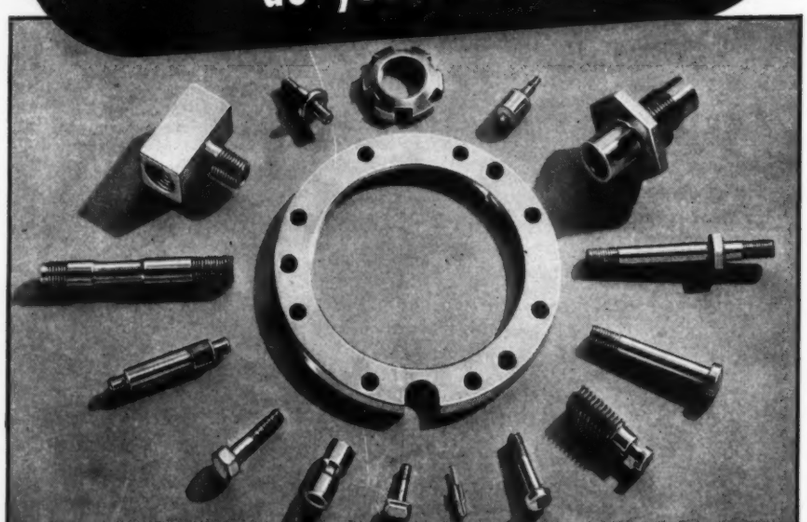
C. H. LeFevre Becomes Sealed Power Ad Manager

THE advancement of Charles H. LeFevre to Advertising Manager of the Sealed Power Corporation, Muskegon, Michigan, has been announced by John E. Norwood, Sales Manager of the Replacement Sales Division.

Charles H. LeFevre

Formerly with the Hackley Union National Bank, Muskegon, LeFevre joined the Advertising and Sales Promotion Department of Sealed Power in 1935 at the age of 21. He became Assistant Advertising Manager in 1943. He will handle the development and placement of trade and national advertising for all divisions of the company. LeFevre is a member of the Automotive Advertisers Council of which he was recently elected Secretary.

What kind of SCREW MACHINE PRODUCTS do you need?



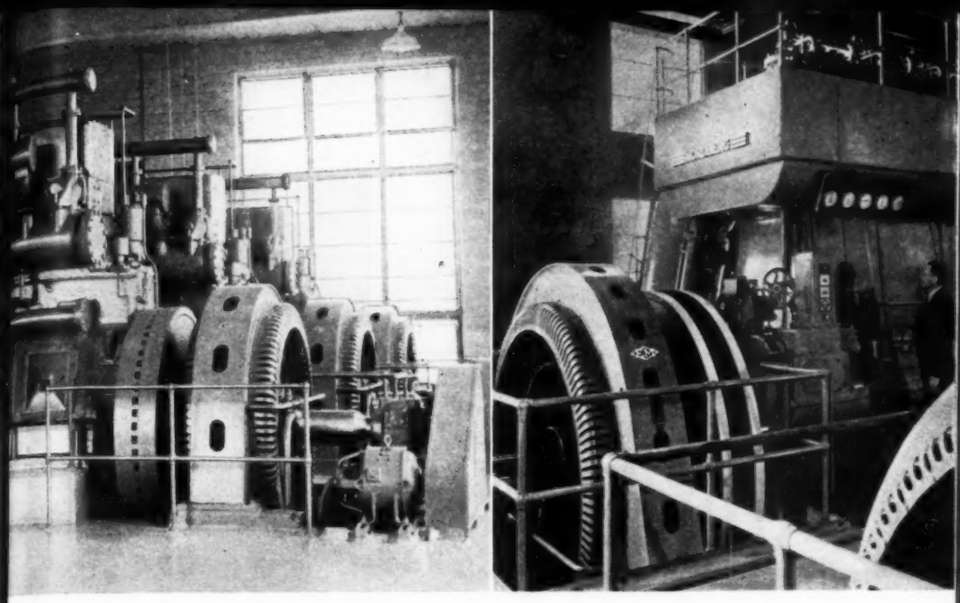
Regardless of the number of intricate finishing operations required to complete the Screw Machine Products you need—you will find The Chicago Screw Company a dependable source of supply . . . For over 73 years we have specialized in the manufacture of screw machine and cold upset products in *any size, any shape* and in unlimited quantities.

All secondary operations are performed in our vast factory, and include Milling, Drilling, Broaching, Grinding of any type—precision Thread Rolling, Hydrogen Brazing, Electronic Heat Treating—all are accurately and rigidly controlled from rough stock to finished product.

If your parts are simple screw machine items or really "fussy" jobs—try "Chicago Screw"—you'll find there is a difference.

ARMY E NAVY

THE CHICAGO SCREW CO.
1026 So. Homan Avenue Chicago 24, Ill.



PROVEN

N REA DIESEL-GENERATING PLANTS

Ask any user of an E-M generator why he likes it. Nine chances in ten, he'll mention *Dependability*—its ability to stay on the job year after year, meeting electrical power demands without interruption of service, with a minimum of maintenance. That dependability is the result of a half-century of *specializing* in the correct engineering and application of large a-c generators.

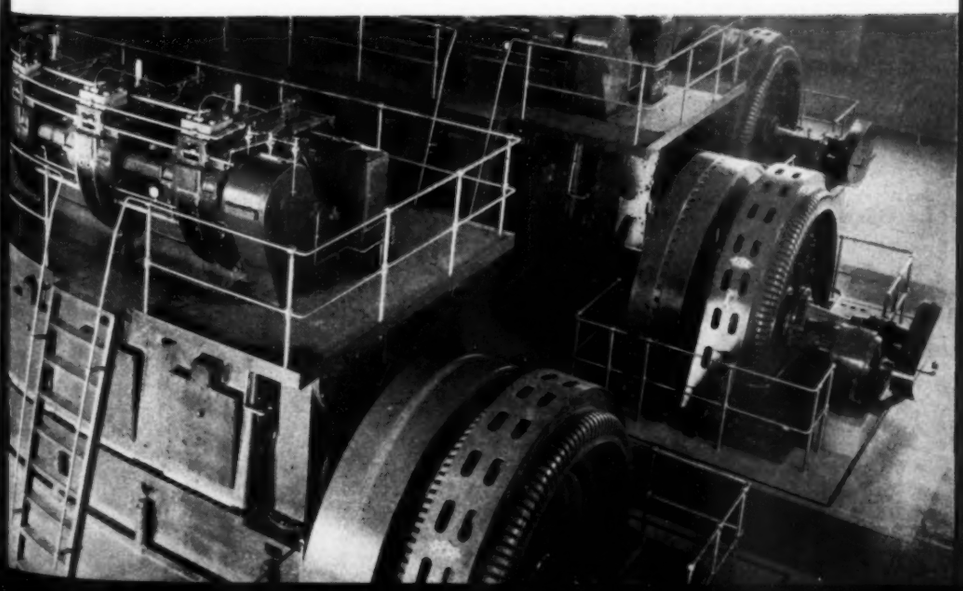
Such dependability, such proven operating experience gained, for example, through furnishing nearly one-half of the total diesel-generated capacity built under REA during its ten years of service . . . is one of your assurances that E-M Generators are the RIGHT generators for YOUR power plant!

Let us share your responsibility in the planning of new electric-generating plants, or in the addition of increased capacity to existing systems. You'll find the vast experience of the E-M field engineer and the factory helpful to you on generator problems, voltage regulation, synchronizing, generator control and other factors involved in the generation of electricity.

ENGINE-TYPE

E-M

A-C GENERATORS



Dependable Electric Power Begins With DEPENDABLE Generators

Generators convert the mechanical power of the engines into electrical power for the distribution system. Upon their unfailing performance depends the successful operation of your power system. No wonder then that generators should be carefully selected . . . they take a leading part in insuring your electric power supply!

Look to E-M For These Features

1. **DESIGNED FOR THE ENGINE.** Matched correctly for best performance.
2. **EASY TO PARALLEL.** Works smoothly with other generators on line.
3. **MODERN CONSTRUCTION.** Welded steel frame is strong and durable.
4. **GOOD APPEARANCE.** Generator is easy to clean and inspect.
5. **MULTI-LAYER COIL INSULATION.** Guards against breakdown.
6. **WELDED DAMPER WINDINGS.** Makes for easy synchronizing, and smooth operation.
7. **COOL RUNNING.** Directed ventilation; modern core construction for cool operation.
8. **3-WAY ADJUSTMENT.** Stator foot adjustment for accuracy and convenience in lining up.
9. **FOOT HEIGHT BUILT FOR THE JOB.** Generator sits at floor level; neater appearance, easy inspection.

FIRST CHOICE FOR POWER PLANTS

ELECTRIC MACHINERY MFG. COMPANY

Minneapolis 13, Minnesota

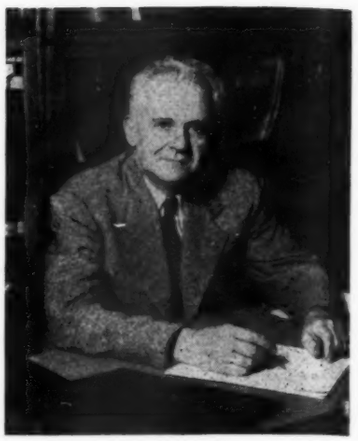
Field Offices in | *Engineering 45 Cities*

A-2022

Walter Parrish Appointed Chief Engineer

IN line with its policy of reconversion, and as an expansion in its peace time production plans, the Rogers Diesel and Aircraft Corporation announces the appointment of Walter Parrish as Chief Engineer.

Mr. Parrish, who for the past five years, has been executive engineer for the Superior Engine Division of the National Supply Company, has had a rich background in the automotive and Diesel fields. From 1927 to 1938, he was associated with the Buda Company, first as assistant to the executive engineer, and later as chief engineer for both gasoline and Diesel engines, assuming charge of all the company's experimental and laboratory work. In the past, Mr. Parrish has been associated with such companies as the Caterpillar Tractor Company, the Cummins Engine Company, the Packard Motor Car Company and the Continental Motor Co.



Walter Parrish

A member of the Society of Automotive Engineers since 1917, Mr. Parrish was appointed Vice President of Diesel Engine Activity for 1945 and a member of the National Council.

As Chief Engineer for the Rogers Diesel and Aircraft Corporation, Mr. Parrish takes charge of the engineering, research and development facilities of the parent company, as well as aiding in the formulation of engineering plans for the entire organization, which includes the Edwards Company, Sanford, N. C.; Hill Diesel Engine Company, Lansing, Mich.; Ideal Power Lawn Mower Company, Lansing, Mich.

BUCKEYE DIESELS

MARINE - STATIONARY

DAY following NIGHT is always DEPENDABLE.

It's the same kind of DEPENDABILITY that has faithfully served owners of Buckeye engines ever since 1908.

When you install a Buckeye Diesel you make a profit-wise investment in LOW COST, EFFICIENT POWER which is the result of more than 37 years of proved engineering ability and manufacturing skill devoted exclusively to the building of marine and stationary engines.

Stationary and Marine Propulsion (Direct Reversing) Engines 150-*1440 H.P.

Marine Auxiliary and Stationary Generator Sets 100-*1000 KW.

*Supercharged Ratings

"Be Profit-Wise and Dieselize with Buckeyes"

THE BUCKEYE MACHINE COMPANY, LIMA, OHIO

• ENGINE BUILDERS SINCE 1908 •

Caterpillar Issues Mine Bulletin

COST-cutting, production-boosting methods for mine and quarry operators are discussed eight-page color publication stresses the need in the new booklet, "In Mine, Pit and Quarry with 'Caterpillar,'" just off the press. The for steady, economical power in unearthing nature's treasures, handling and transporting, and processing and refining to convert them into a usable state. To receive a free copy, please request Form 8997 from Caterpillar Tractor Co., Peoria 8, Illinois.

Complete, All-Purpose Filter In One Self-Cleaning Housing

THE new Adams twin filter is a complete filter plant, ideal for a wide variety of applications wherever water must be "polished" for drinking purposes, bakery supply, restaurant and hotel service, laundry and paper mill shower use as well as general industrial water systems.

The Adams TF-1 filter plant is a self-contained unit, easy to install and self-cleaning in operation. It is available in three types of filtering tubes for use on pre-filtered (city) water as well as cloudy water from rivers, lakes and deep wells. For full details write for Bulletin 675, R. P. Adams Company, Inc., 55 Chicago Street, Buffalo, N. Y.

WALWORTH LUBRICATED PLUG VALVES

offer these advantages

- . . . Direct port opening
- . . . Quarter turn opens or closes valve
- . . . Dead tight shut-off
- . . . Freedom from attack by fluids being handled
- . . . Pressure sealed
- . . . Made in a complete line. Sizes from ½" to 24" for pressures from 125 to 5,000 psi., and for vacuum requirements

THESE are just a few of the reasons why Walworth Lubricated Plug Valves give "top" performance on many *difficult* services.

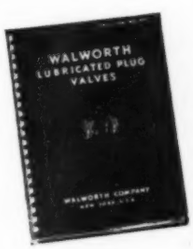
All Walworth Lubricated Plug Valves employ special insoluble lubricants which protect the plug and body against contact with the line fluid, thus combatting erosion and corrosion.

The lapped surfaces of the valve are "pressure sealed" when the valve is in either the open or closed position. By turning the lubricant screw, lubricant is forced under high pressure through a grooving system that completely encircles the parts as well as the top and bottom of the plug.

The lubricant seals the valve against leakage, and reduces friction between plug and body. This permits easy, quick, full-opening, or tight shut-off with only a quarter turn of the plug.

Fig. 1700 (illustrated) is a Steeliron valve, wrench operated, designed for a working pressure of 200 pounds WOG (water, oil, or gas). Valves are available in either screwed or flange types. Screwed type have API line pipe thread lengths. Flanged type are faced and drilled to American Standard for 125-pound cast iron flanges unless otherwise specified.

For further information about Fig. 1700, as well as the complete line of Walworth Lubricated Plug Valves write for Catalog No. 44L.



SEND FOR THIS FREE CATALOG

This new Walworth Lubricated Plug Valve Catalog No. 44L is just off the press. It gives prices, sizes, dimensions, and other pertinent data on this comprehensive line. A request on your company's letterhead will bring you a free copy of this informative catalog.

14 AWARDS TO 4 PLANTS

WALWORTH

valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

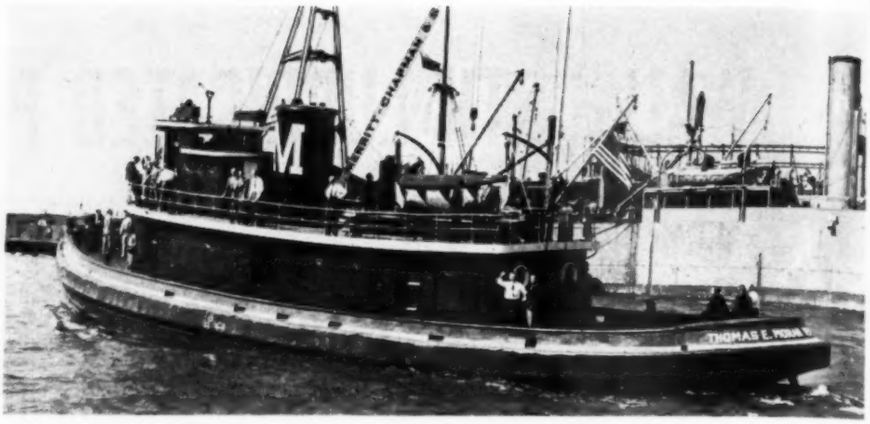
DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

General Motors Repowers Tug for Moran

THE installation of a General Motors-built Diesel engine for repowering a 105 steel hull has made possible almost a hundred per cent increase in power output while reducing engine space to less than one-third the space formerly required, according to Frank Belford, Jr., vice-president in charge of operations for the Moran Towing and Transportation Company.

This information was made available to more than two score marine editors on the initial run of the *Thomas E. Moran*, the latest addition to the fleet of towboats operated by this company in the Port of New York and other eastern seaboard ports. Powered by a single engine built by the Cleveland Diesel Engine Division of General Motors Corporation, the *Thomas E. Moran* represents a far more efficient towboat than it was in its original state.

Statistics on performance of the craft indicate that the Diesel electric propulsion has improved the performance of the tug in every respect. The engine delivers in excess of 1,000 shaft horsepower compared to the larger power plants output of only 650 horsepower.



Among the first pieces of reconverted equipment to enter New York harbor was the "Thomas E. Moran," a sea-going vessel, powered with a General Motors, Cleveland Diesel of 1200 hp. for main propulsion and a General Motors, Detroit Diesel auxiliary generator set.

This is the same Diesel engine used in 46 types of Navy craft. According to observers aboard the craft on its initial run the boat romped through its paces and proved to be superior in all departments—size, speed, power and flexibility.

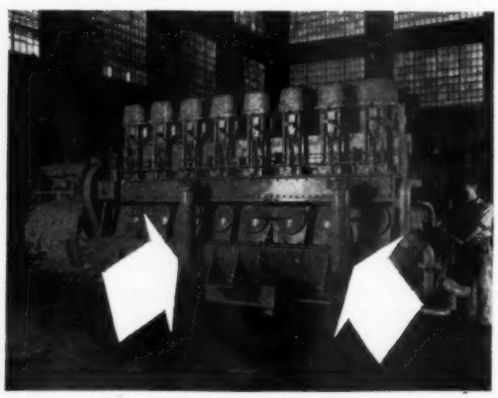
According to Mr. Belford this is but the forerunner of many such alterations on the giant fleet of Moran boats. In the immediate postwar period 25 per cent of the present fleet is to be replaced with this type of modern equipment. The necessity of keeping all available towboats in operation during the war was the only factor involved in delaying the modernization to this late date, it was stated.

NEW 2000 HP LOCOMOTIVE USES NUGENT FILTERS

for cleaner oil.. ..greater efficiency

• This new 2000 HP diesel locomotive for both freight and passenger service is driven by two 8 cylinder diesel engines. Each engine has two Nugent Lube Oil Filters, for thorough protection against dirt and foreign matter in the lubricating oil.

Nugent filter protection increases engine efficiency, prevents trouble by removing dirt particles to insure virtually 100% clean oil. Nugent filters have 20 times more filtering area than most filters of comparable size. Write today for bulletin 7A which gives full details.



One of the two 8 cylinder diesels that power this new 2000 HP locomotive. Arrows show the Nugent Lube Oil Filters that keep oil practically 100% clean.

Nugent Filters

ESTABLISHED 1897

WM. W. NUGENT & CO., INC.

415 N. Hermitage Ave. Chicago 22, Illinois

FUEL OIL FILTERS • LUBE OIL FILTERS • LUBRICATING SYSTEMS • SIGHT FLOW INDICATORS • FILTER BAGS

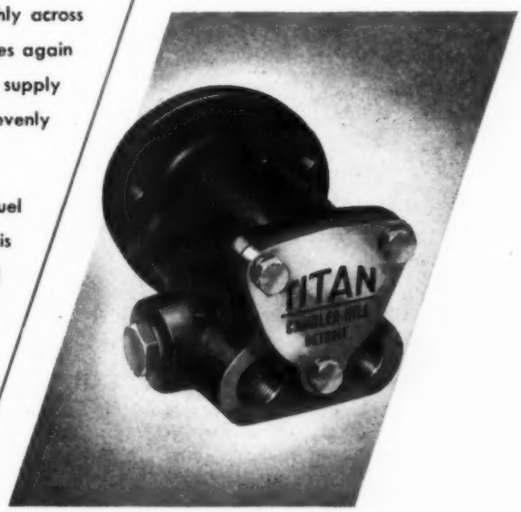
POWER

STOP AND GO—OR—CONSTANT FLOW
A TITAN DIESEL SUPPLY PUMP DELIVERS!

A streamlined locomotive whisks its load smoothly across the land . . . a bulldozer lunges, backs and lunges again to clear a way through debris . . and a Titan fuel supply pump helps both Diesel-powered engines perform evenly under their vastly different loads.

The experience gained in building over 600,000 fuel pumps to rigid military specifications stands behind this pump. Titan *Precisioneers* have improved and simplified the design . . . made maintenance easy . . at reduced initial cost. Capacity, mounting and drive arrangement readily adaptable to your engine.

This pump can be the answer to your fuel transfer troubles and our engineering staff will gladly work with you in adapting it to fit your particular needs.



TITAN PUMPS

CANDLER-HILL CORPORATION • *DIVISION OF*
TITAN PUMP AND ENGINEERING CORPORATION
405 Midland • **Detroit 3**

TITAN Pumps are Precision Built by Precisioneers

D.E.M.A. Issues First Booklet of "Diesel Facts" Series

GROWING demand for Diesel engines for producing the power in municipally-owned power plants is revealed in a new booklet published by Diesel Engine Manufacturers Association. Covering the use of Diesels in city power plants, the booklet is the first of a series to be issued by the association under the general title, "Diesel Facts."

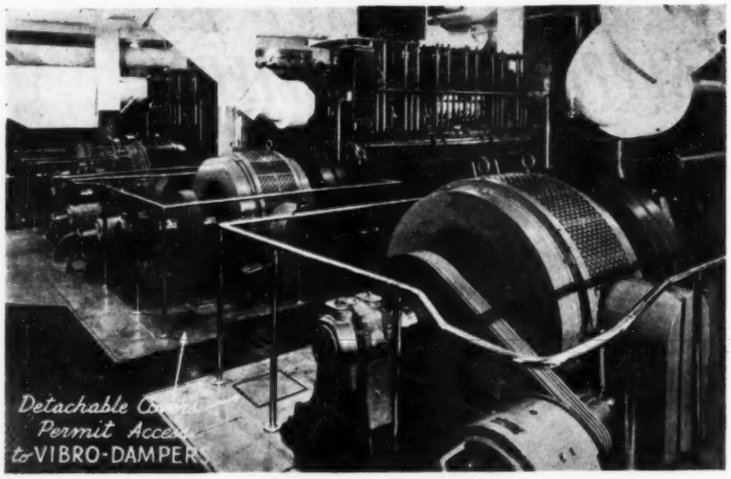
The Diesel's operating economy and reliability are cited as the chief reasons for its growing popularity in this type of service. Other advantages are the simplicity and compactness of a Diesel power plant, its cleanliness, and the minimum of attention required for its operation.

Savings effected by Diesels over other types of power have been spent by municipalities in a variety of ways. In many cases they have been used to pay for the engines themselves. In other instances they have made it possible to reduce power rates. Taxes have been lowered in a number of communities, while others have used their power plant savings to improve street lighting, water service, or police protection.

A special section of the booklet treats of the procedure to be followed by a city that wants to have its own power plant. Another section outlines the widespread use of Diesel engines in the generating projects of the Rural Electrification Administration. A survey of potential peacetime uses of Diesel engines has been made by Diesel Engine Manufacturers Association.

Future booklets to be issued by the Diesel Engine Manufacturers Association will deal with Diesel engine applications in ships, locomotives, the oil industry, and various stationary usages. Copies of the booklet may be secured from Diesel Engine Manufacturers Association, One North La Salle Street, Chicago 2, Illinois.

THERE'S ONE ANSWER TO MOST DIESEL VIBRATION PROBLEMS



These Diesels are mounted on concrete foundations and isolated with Korfund Steel Spring Vibro-Isolators

. . . IT'S KORFUND VIBRATION CONTROL

Any type of engine is likely to cause vibration. To be certain your Diesel installation is free of costly, unpleasant vibration, do as hundreds of other building and plant owners have done, install Korfund Steel Spring Vibro-Isolators.

Here are a few of the hundreds of installations where stationary engines mounted on concrete foundations have been isolated by Korfund Vibration Control:

Lone Star Gas Co., Dallas	1 400-hp. Cooper-Bessemer
Prudential Insurance Co., Newark	1 740-hp Baldwin
Times Publishing Co., Pawtucket	2 Model #2 Buckeyes
B. Altman & Co., New York	2 860-hp. Alcos
Western Electric Co., New York	1 290-hp. Ingersoll-Rand
Western Electric Co., New York	1 220-hp. Ingersoll-Rand
Namm Department Store, Brooklyn	4 300-hp. Worthingtons
Namm Department Store, Brooklyn	1 180-hp. Worthington
Namm Department Store, Brooklyn	1 150-hp. Worthington
Rochester Telephone Co., Rochester	1 D-17000 Caterpillar

If you have a vibration problem, call on Korfund, without obligation. Our engineers will analyze your problem and recommend the correct vibration control equipment.

KORFUND
VIBRATION CONTROL
THE KORFUND COMPANY, Inc., 48-28 32nd PL., LONG ISLAND CITY 1, NEW YORK

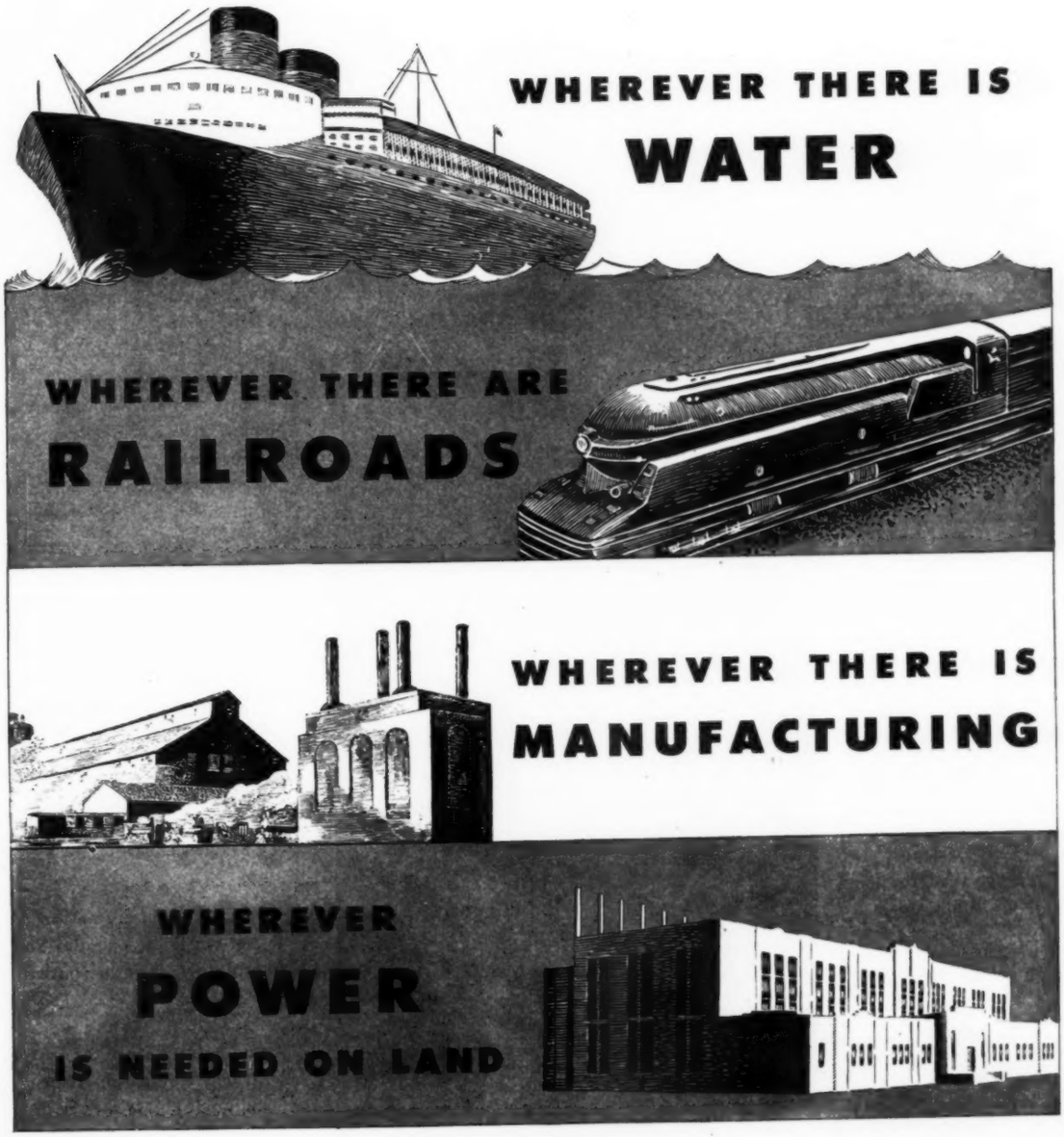
Caterpillar Vice President to Manage California Plant

W. O. BATES, Jr., Vice President of Caterpillar Tractor Co., Peoria, Illinois has moved to San Leandro, California to assume full-time administrative responsibilities as manager of the "Caterpillar" offices and plant there.

Mr. Bates was appointed San Leandro manager early this year, but has divided the intervening time between the California plant and "Caterpillar's" subsidiary, Caterpillar Military Engine Company of Decatur, Illinois where since November, 1942 he has served as a vice president.

W. O. Bates, Jr.

"Caterpillar" operations at San Leandro, of which Mr. Bates will be in charge, include Pacific Coast offices, parts distribution depot and extensive manufacturing facilities. Plant production includes vital fuel injection equipment for Diesel engines, and replacement parts for "Caterpillar" machines in the western territory.



PRODUCERS OF HAMILTON-DIESELS, STEAM ENGINES AND MACHINE TOOLS

Wherever They Are Needed

GENERAL MACHINERY CORPORATION

HAMILTON, OHIO

THE NILES TOOL WORKS CO. THE HOOVEN, OWENS, RENTSCHLER CO. • GENERAL MACHINERY ORDNANCE CORPORATION

Sealed Power To Build New Plant

SEALED Power Corporation of Muskegon, Michigan, manufacturers of piston rings and other motor parts, has announced completion of arrangements to erect a new plant at St. Johns, Michigan. According to Neil A. Moore, general manager, the postwar demands for the company's products will require considerably more capacity than is available with its present plants at Muskegon.

Taking advantage of many improvements in manufacturing methods which Sealed Power Corporation has developed recently, the St. Johns plant will concentrate on the production of piston rings for manufacturers of new passenger cars and trucks. Production in the new St. Johns plant is expected to start about January 1, 1946. Expansion of original equipment manufacturing facilities at St. Johns will result in a marked increase in production of replacement parts, piston rings and related products.

ENGINEERED AND BUILT *for Big Jobs*

Fulton Diesels are the products of engineering skill accumulated over a period of 93 years of successful heavy machinery design — our shops are amply equipped to finish the heaviest of parts to close limits. Every detail of material and workmanship that enters into the Fulton Diesel is aimed at long life and outstanding economy in operation and maintenance—sound engines through and through — that is why

Fulton Diesels are specified for long range power projects.

1852 Successful Engine Builders For 93 Years 1945

FULTON IRON WORKS CO.

• ST. LOUIS • MISSOURI •

Those Who Can See Please Read This to Some Blind Friend

RALPH TEETOR, prominent automotive engineer and former president of the Society of Automotive Engineers, who has been sightless since the age of five, addressed 200 blinded veterans of this war at the Valley Forge General Hospital recently, telling them that "nothing can stop you from enjoying a normal, happy life once you have made up your mind that is what you are going to have."

Now vice president and chief engineer of The Perfect Circle Company and a member of the War Engineering Board, Mr. Teetor lost his sight following an accident in 1896. He was graduated from the Engineering School of the University of Pennsylvania in 1912, embarking immediately upon his career in automotive engineering. During World War I, he developed a procedure for balancing turbine rotors in destroyers that still is used today.

"In all of your experiences from now on," Mr Teetor told his audience, "you will find that you have to 'sell' yourself to almost every person you meet. People will doubt your ability to do a job, but you must convince them that not only can you do that job, but also you can do it as well as anyone else.

"Choose the field for which you feel you are qualified. Work hard to learn as much as you can about it. When you feel you are ready, go to it.

"Remember, you are not handicapped so long as you can think logically. You will be handicapped only if you are slovenly in your thinking.

"Many times during the past 49 years people have told me how sorry they were that I am 'handicapped.' My answer to them always has been that I am not handicapped, because I never have considered myself so.

"If anyone in the whole world has had more fun out of life than I have had, I should like to meet him. I am quite sure no one has enjoyed living more than I.

"It will take courage and hard work for you to become accustomed to your new way of life. But you will make it by holding your heads high and never allowing yourselves to falter."

Colonel W. W. Vaughan, Commanding Officer of the hospital, introduced Mr. Teetor to the audience and presided over a question and answer period that followed the address.

Inside an engine, Pedrick rings make things go like clockwork

MORE POWER, more pep, more hours on the job . . . that's the report we've been hearing from users of Pedrick rings for twenty-five years. Once Pedrick rings are in, it's a long, long time before you need to recondition again.

And Pedrick rings make engine-repair jobs go like clockwork, too. Technical literature, service manuals, field men, special bulletins are a part of Pedrick service that leaves nothing undone to help make ring jobs easy and accurate. Even "green" help find Pedrick rings easy to install right.

The day of plenty of new Diesels is still months away. To get extra hours of efficient service from your present equipment, to hold down shop and operating costs, recondition with Pedrick *precisioneered* piston rings. WILKENING MANUFACTURING CO., Philadelphia 42, Pa. *In Canada:* Wilkening Manufacturing Co. (Canada) Ltd., Toronto.

The Emblem of Honorable Discharge from the United States Armed Services

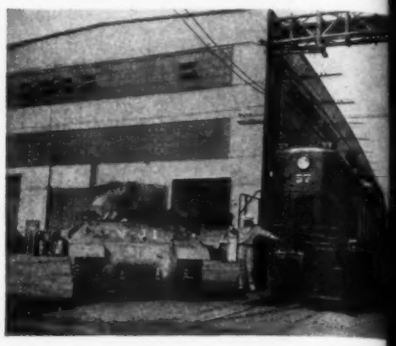
Pedrick
precisioneered PISTON RINGS

Diesel Locomotive Takes Right-of-way

PRODUCTION right of way now goes to locomotives at the Schenectady, N. Y., plant of American Locomotive Company as war requirements for tanks and tank destroyers are curtailed. Cancellation of the last tank contract was received by the company Friday, August 24.

Reconversion problems are at a minimum at this locomotive plant for both tanks and locomotives have been built here throughout the war. It will be remembered that the first medium tank produced by private industry was fashioned in 1941 by the skilled hands of locomotive workers at this American Locomotive Company plant.

In five years the company has produced thousands of medium tanks and tank destroyers, including the "secret weapon," the M-7, which surprised the Nazis at El Alamein. More than a billion dollars worth of equipment have been produced by the company during the war, more than 850 millions directly for war.



Last of the M-36 tank destroyers, mounting a 90mm gun, and a new American Locomotive-General Electric 1000 horsepower Diesel-electric unit.

KEEP THOSE DIESELS IN SERVICE

TO CLEAN OUT THE ENGINE

TO KEEP IT CLEAN

Smart Diesel men practice *protective maintenance* to insure long-life and economical operation of transportation and stationary engines — never relax their fight against sludge, gum, acid and corrosion.

Simplicity itself—LOOSITE safely and economically rids the entire lubrication system of dangerous petroleum residues. Then SILOO DIESEL, added to fresh crankcase oil, functions *continuously* — preventing further accumulations. Engines operate at maximum efficiency, oil reaches every vital part — thus costly layups and repairs are avoided . . . engine life prolonged.

SILOO SPECIAL FOR DIESEL INJECTORS eliminates and prevents clogging of injectors and SILOO FUEL OIL TANK SOLVENT is a positive acting treatment for cleaning fuel oil tanks and removing condensation and polymerized gums. Full information on *all* SILOO products—engineered to your needs — will be sent you on request. LOOSITE and SILOO can be used safely and effectively with *any* type oil and filter.

PETROLEUM SOLVENTS CORPORATION

General Offices: 331 Madison Ave., New York 17, N. Y.

If you heat with oil ask about SILOO FUEL OIL TANK SOLVENT

Pedrick Adds Homer Hard To Technical Staff

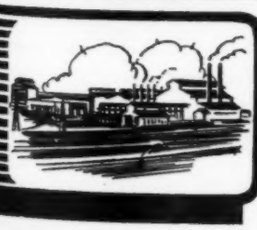
TO assist in the production of technical service literature, instruction manuals and other technical data on Pedrick piston rings, Homer W. Hard has been added to the technical staff of Wilkening Manufacturing Co., Philadelphia.

Homer W. Hard

For the past three years Mr. Hard has been engaged in training and instruction work for the Air Service Command. Prior to that, for 16 years he was with the Studebaker Corp. in research and development engineering, in production inspection, and as Service Manager. As one of the pioneers in the production of technical service literature for mechanics, the Wilkening organization plans greatly expanded service information as soon as conditions permit.

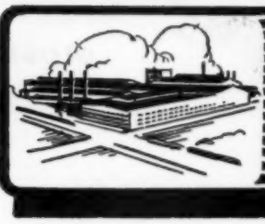
One RESPONSIBILITY... *One* CONTROL

FROM raw materials to finished product . . . your specifications are carefully and accurately worked to completion . . . ***one definite control*** and ***one responsibility*** . . . these advantages are yours when you place your requirements for special forgings and steel castings with the Erie Forge Company.



ERIE FORGE COMPANY, ERIE, PA.

★ ★ ★ ★ ★ ★ ★ ★ ★



New Bulletins On Hydraulic Pumps

BULLETINS 012-G and 013-G have just been issued by John S. Barnes Corporation. The first mentioned bulletin describes the Barnes automatic reciprocating cylinder hydraulic unit, also the Barnes self-contained hydraulic unit giving specifications, suggested applications and dimensions. The second bulletin, No. 013-G is an 8-page booklet, packed with helpful suggestions on the installation, operation and maintenance of hydraulic systems including charts useful in selecting hydraulic tubing. Engineers concerned with design or operation of hydraulic systems will find these bulletins most helpful and may secure copies of them by writing John S. Barnes Corporation, Rockford, Illinois.

Wausau Appoints E. R. L. Boyd

WAUSAU Motor Parts Company announce the appointment of E. R. L. (Earl) Boyd as Divisional Salesmanager of their western state division.

E. R. L. Boyd

Mr. Boyd was formerly with the Columbia Steel Company, a west coast subsidiary of the United States Steel Corporation. Prior to this period of employment he acquired a wealth of experience in the automotive field with the Waverly Oil Company, Ray Day Piston Corporation and the Hastings Manufacturing Company. Mr. Boyd's headquarters will be in San Francisco. Branch factory warehouses under his supervision will include Seattle, San Francisco, Los Angeles and Denver. His many friends in the automotive industry will be happy to learn of his return to this field as Divisional Salesmanager for the Wausau Motor Parts Company.

F. A. Donaldson, Inventor, Dies

FRANK A. DONALDSON, 56, president of the Donaldson Company, Inc., St. Paul, recently died at his home in Minneapolis. He was inventor of the first air cleaners ever applied to tractors, while he was field engineer for the Bull Tractor Company, Minneapolis. In 1915, he began manufacturing the device in his own company. Native of Rochester, Minnesota, Mr. Donaldson was a graduate of University of Minnesota college of engineering. He was a member of the Society of Automotive Engineers, Society of Agricultural Engineers and Alpha Tau Omega academic fraternity. He was a director of the Waters Conley Company, Rochester, director of the National Association of Manufacturers and director on the St. Paul committee on industrial relations.

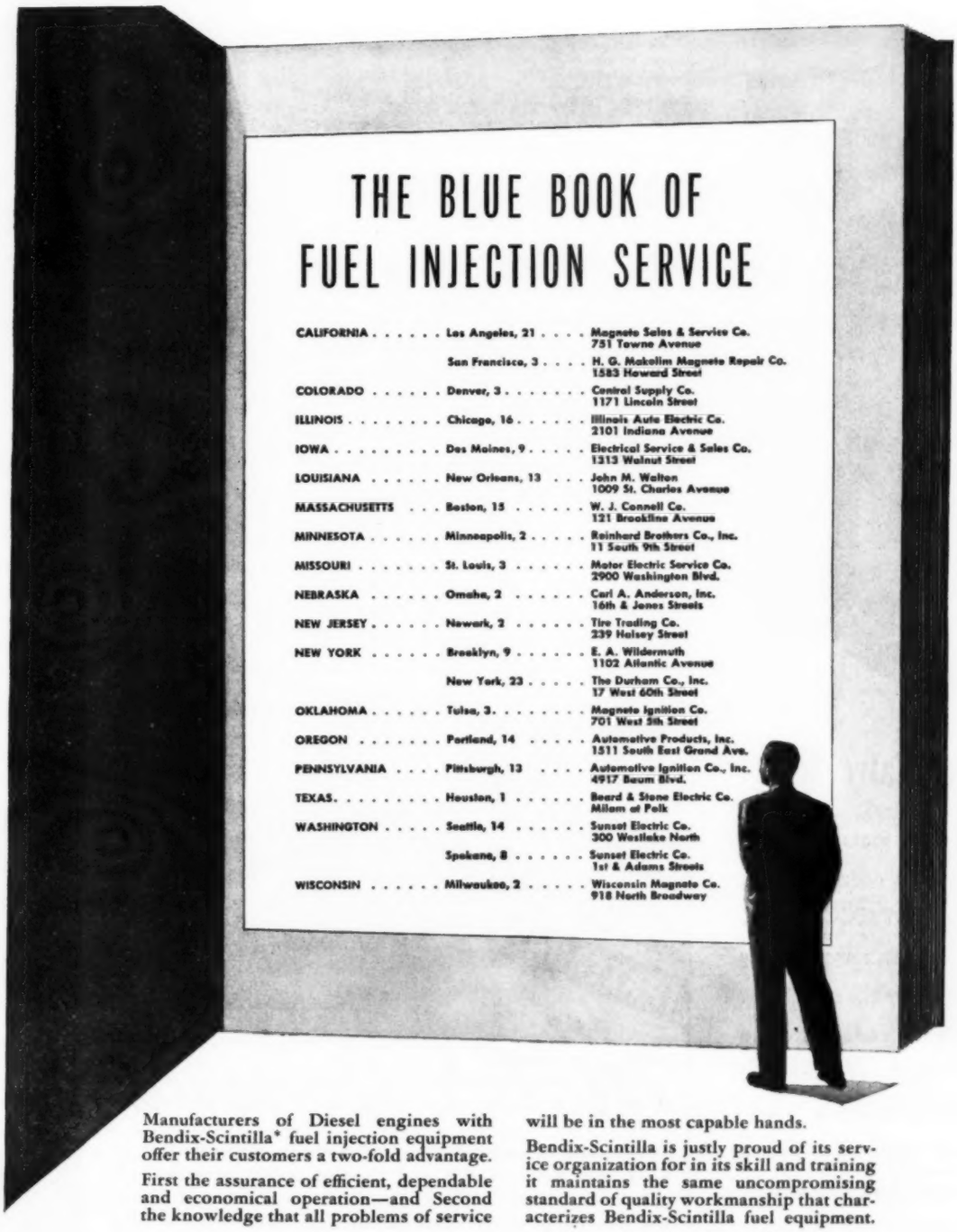
ALL the dependable power of Diesels gets under way quickly when you rely upon Globe *Spinning Power* Batteries. These sturdy batteries are noted for their ability to match the performance of rugged Diesel engines. Patented Perma-Set plates assure long, uniform, reliable service . . . button-quick starting at any temperature.

A Globe engineer will gladly discuss your battery requirements with you. Just address the Globe-Union factory in the city nearest you.

GLOBE-UNION INC. • Milwaukee 1, Wisconsin

ATLANTA • BOSTON • CINCINNATI • DALLAS • KANSAS CITY
LOS ANGELES • MEMPHIS • MINNEAPOLIS • PHILADELPHIA • SEATTLE

OP-1045



THE BLUE BOOK OF FUEL INJECTION SERVICE

CALIFORNIA	Los Angeles, 21	Magneto Sales & Service Co. 751 Towne Avenue
	San Francisco, 3	H. G. Makolim Magneto Repair Co. 1583 Howard Street
COLORADO	Denver, 3	Central Supply Co. 1171 Lincoln Street
ILLINOIS	Chicago, 16	Illinois Auto Electric Co. 2101 Indiana Avenue
IOWA	Des Moines, 9	Electrical Service & Sales Co. 1313 Walnut Street
LOUISIANA	New Orleans, 13	John M. Walton 1009 St. Charles Avenue
MASSACHUSETTS	Boston, 15	W. J. Connell Co. 121 Brookline Avenue
MINNESOTA	Minneapolis, 2	Reinhard Brothers Co., Inc. 11 South 9th Street
MISSOURI	St. Louis, 3	Motor Electric Service Co. 2900 Washington Blvd.
NEBRASKA	Omaha, 2	Carl A. Anderson, Inc. 16th & Jones Streets
NEW JERSEY	Newark, 2	Tire Trading Co. 239 Halsey Street
NEW YORK	Brooklyn, 9	E. A. Wildermuth 1102 Atlantic Avenue
	New York, 23	The Durham Co., Inc. 17 West 60th Street
OKLAHOMA	Tulsa, 3	Magneto Ignition Co. 701 West 5th Street
OREGON	Portland, 14	Automotive Products, Inc. 1511 South East Grand Ave.
PENNSYLVANIA	Pittsburgh, 13	Automotive Ignition Co., Inc. 4917 Baum Blvd.
TEXAS	Houston, 1	Beard & Stone Electric Co. Milam at Polk
WASHINGTON	Seattle, 14	Sunset Electric Co. 300 Westlake North
	Spokane, 8	Sunset Electric Co. 1st & Adams Streets
WISCONSIN	Milwaukee, 2	Wisconsin Magneto Co. 918 North Broadway

Manufacturers of Diesel engines with Bendix-Scintilla* fuel injection equipment offer their customers a two-fold advantage.

First the assurance of efficient, dependable and economical operation—and Second the knowledge that all problems of service will be in the most capable hands.

Bendix-Scintilla is justly proud of its service organization for in its skill and training it maintains the same uncompromising standard of quality workmanship that characterizes Bendix-Scintilla fuel equipment.

*TRADE MARK

SCINTILLA MAGNETO

Division • Bendix Aviation Corporation • Sidney, N.Y.

FUEL INJECTION PUMPS

The simple design and precision manufacture of these pumps assure dependable engine performance. Supplied for a wide range of engines.

NOZZLE HOLDER ASSEMBLIES

Supplied in a variety of lengths, with separate spray tips. Also liquid-cooled units interchangeable with uncooled units.

BENDIX-SCINTILLA UNIT INJECTORS

A fuel injection pump and nozzle assembly combined *in a single unit* —the Unit Injector—eliminates long high pressure fuel lines and any possibility of uneven timing.

PRODUCT OF Bendix AVIATION CORPORATION

. . . It's no "Grind" . . .

Grinding Diesel Locomotive Valve Seats

. . . to Service Valve Seats!

Servicing diesel valve seats is a fast, easy, factory-precision operation with the HALL Model EDP ECCENTRIC Valve Seat Grinder. It removes only enough metal to true up the seat. Saves the valuable hardened surface created by the seating action of the valve under terrific heat. The result: better valve performance longer at less cost. Write today for complete information.

THE HALL MFG. COMPANY
TOLEDO 7, OHIO

HALL DIESEL TYPE VALVE SEAT GRINDER

Atlas Announces Appointments

THE Atlas Imperial Diesel Engine Co., which has announced several changes in top management, stresses that there will be very little change in company policy.

"For many years," said R. J. Miedel, the new president, "selection of types of engine to be manufactured and general control of operations has been in the capable hands of G. F. Twist, who is, and has been for some time, vice president and general manager. There will be no change in this arrangement."

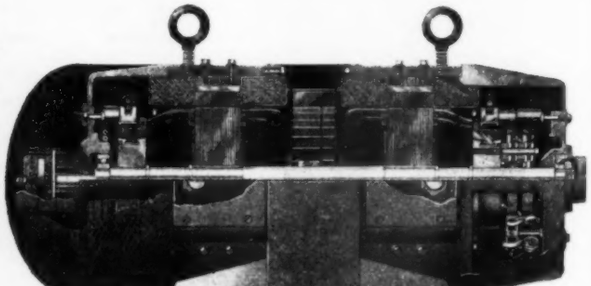
Miedel comes to Atlas Diesel from Hazel Atlas Glass Company where, for the pas thirty years he has established a considerable reputation for himself and for that company. He expects to concern himself chiefly with the business affairs of Atlas Diesel.

"We plan to continue making the same types of engines as in the past," said G. F. Twist. "Of course, we have used and are using our wartime experience to bring our product up to date and we shall make a slightly wider range to have an engine specifically suited to every job in our field. For the time being we have no intention of making any radical departures from the type on which our reputation has been built." Twist, a graduate of Stanford University School of Engineering, has been with Atlas for 15 years.

G. F. Twist

Another notable addition to the Atlas team is John W. Anderson, well known Diesel designer, who comes to Atlas as executive engineer after spending the last eight years with American Locomotive as chief engineer of Diesel engines.

IT'S WHAT IS ON THE INSIDE THAT COUNTS in Motor Generators!



The well balanced design in the above cutaway view of Kurz and Root DC-AC two bearing motor generator set assures an efficient, compact, smooth operating unit. Note the electric governor mounted on shaft extension on drive end, and armatures mounted on one common rugged shaft supported at each end by oversized ball bearings. Built in ratings 1 KW to 15 KW output.

AC-DC GENERATORS

KURZ and ROOT Company Since 1898

APPLETON · WISCONSIN

.....and DC motors and motor generator sets

SEND

SEND for new illustrated catalog of complete line of generator sets, generators and motors—yours free upon request.

Anderson, a graduate of M.I.T., has specialized in Diesel design since 1910 when he went with the Electric Boat Company, makers of marine and submarine Diesels. Since then, working on the staff of De Lavergne Machine Co., Nordberg, National Transit Pump and Machine Co. and as a consultant on his own account he has made many important contributions to Diesel advancement.

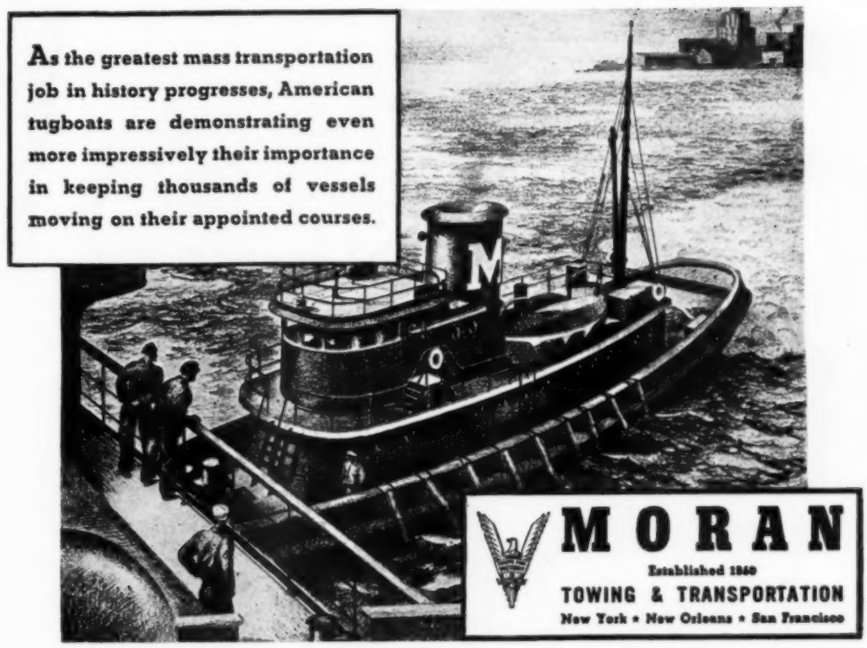
John Anderson

He is author of the popular book, "Diesel Engines," the standard college text book, "Diesel Engineering," and the handbook, "Diesel Operator's Manual," all published by McGraw-Hill. Working with Rex Wadman he edited the first two volumes of the "Diesel Engine Catalog."

Another major Atlas appointment is that of Svend Amdisen as secretary. Amdisen, for the last four and a half years, has been secretary-treasurer of Adel Precision Products Corp. of Burbank.

Diesel Equipment Company of Memphis Appointed Briggs Distributor

DIESEL Equipment Company, 808 South 2nd Street, Memphis, Tennessee, has been appointed distributor for Briggs Clarifier Company. The territory assigned includes Western Tennessee and Northeastern Arkansas and portions of Southeastern Missouri, Southern Illinois, Southern Indiana and Southern Kentucky. Principal trading centers in this area include Nashville and Memphis, Tennessee; Evansville, Indiana; and Paducah, Kentucky. Worthington Brown and William F. Fay who jointly own and manage the firm have had many years experience in the distribution and servicing of industrial products. They are intimately acquainted with the territory assigned to them. They are fully equipped to give prompt and efficient service to present and future Briggs customers.


As the greatest mass transportation job in history progresses, American tugboats are demonstrating even more impressively their importance in keeping thousands of vessels moving on their appointed courses.
MORAN
Established 1860
TOWING & TRANSPORTATION
New York • New Orleans • San Francisco

Sarco Blenders on Diesels
LOW COST JACKET WATER CONTROL
Correct cooling water temperature benefits four ways—in engine efficiency, in amount of lubricating oil used, in the elimination of unnecessary shutdowns and repair bills, and in conservation of water supply.
The Sarco Blender is a simple, sturdy, three-way thermostatic mixing valve. It automatically recirculates a varying portion of the cooling water and maintains constant jacket water temperature.
Valves are of the double-ported, fully balanced piston type. Operation is unaffected by differing or fluctuating water pressures within reasonable limits.
Sizes up to 6". Pressures to 150 lbs. Ask for Bulletin 700.
SARCO
SAVES STEAM
SARCO COMPANY, INC.
475 Fifth Avenue, New York 17, N. Y.
SARCO CANADA, LTD., 85 Richmond St. W., TORONTO 1, ONT.
958

A COMPOSITE CATALOG
OF THE
ENTIRE DIESEL INDUSTRY

More than **300**
American-made
Diesels described
PROFUSELY ILLUSTRATED

Volume 10

Here is the book you have been looking for — a book you need now and will use throughout the coming year. Not a book to read and lay aside — but one to which you will frequently refer; — Design and operating engineers, Diesel students, purchasing and sales executives — in fact all who are interested in Diesel engines, accessories and plant equipment, keep The DIESEL ENGINE CATALOG within reach all the time — because it is the Diesel "bible", a big book — 10⅛" x 13½" — 530 Pages and a really big value. Rex W. Wadman, editor, conceived the DIESEL ENGINE CATALOG as a "Cross Section of The Diesel Industry" — just that; and through ten consecutive editions the book has been greatly expanded each year to keep pace with the rapid growth of the Industry. This 10th edition, the largest and most complete of all, carries descriptions of more than 300 American-made Diesels with a large section devoted to Diesel engine accessories and plant equipment— a most useful and indispensable book.

USE THIS CONVENIENT COUPON

$10

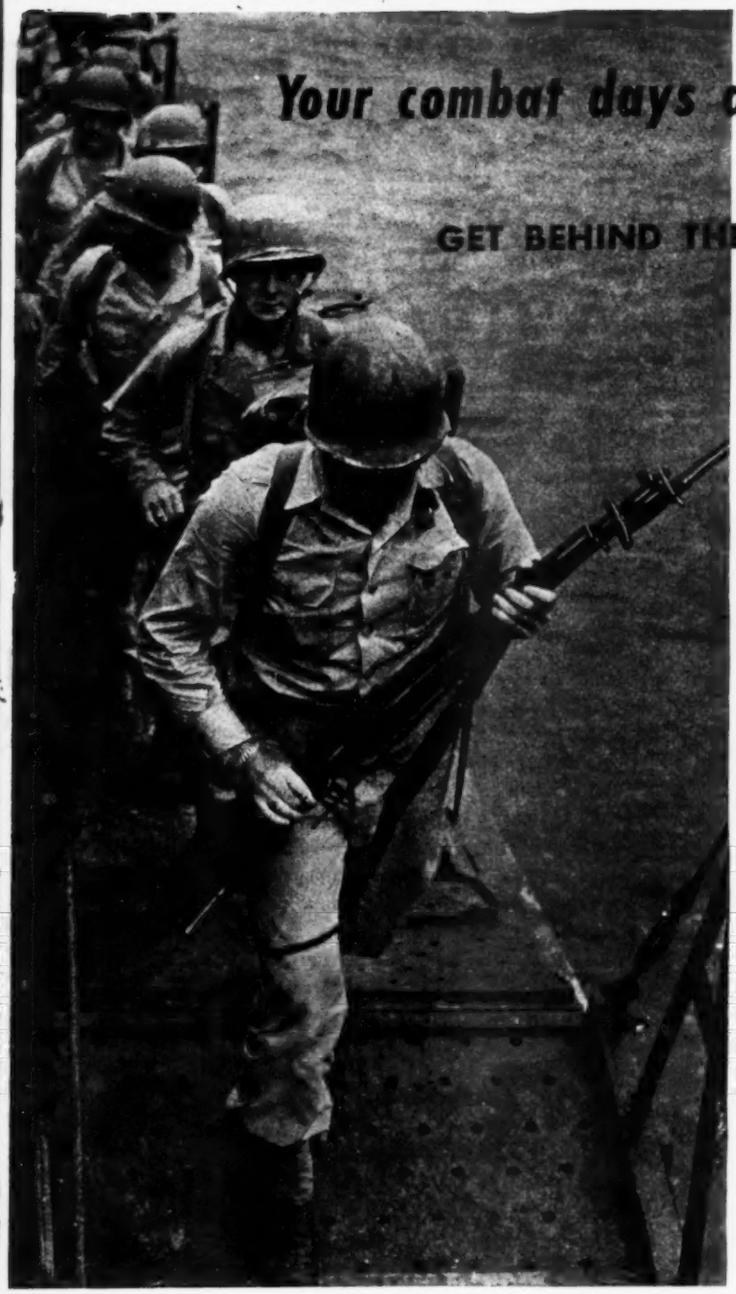
ORDER YOUR COPY
NOW

DIESEL ENGINE CATALOG — Two West Forty-Fifth Street — New York 19, N. Y.
Enter my order today for a copy of the New Diesel Engine Catalog, Volume Ten, Edited by Rex W. Wadman, for which I enclose $10.00.

NAME .....

ADDRESS .....
CITY ZONE STATE

PLEASE PRINT NAME AND ADDRESS



GET BEHIND THE

VICTORY LOAN!

There's plenty of action ahead for fast-thinking industrial leaders in putting over the new Victory Loan! Your Victory drive is important because:

EVERY VICTORY BOND HELPS TO

1. **Bring our boys back to the America for which they were willing to give their lives!**
2. **Provide the finest of medical care for our wounded heroes!**

BOOST THE NEW F. D. ROOSEVELT MEMORIAL $200 BOND!

Urge all your employees to buy this new Franklin Delano Roosevelt Memorial $200 Bond through your Payroll Savings Plan! At all times better than ready cash, Victory Bonds are industry's "Thanks" to our returning heroes!

START YOUR VICTORY DRIVE TODAY!

Every Victory Bond aids in assuring peacetime prosperity for our veterans, our nation, your employees—and your own industry!

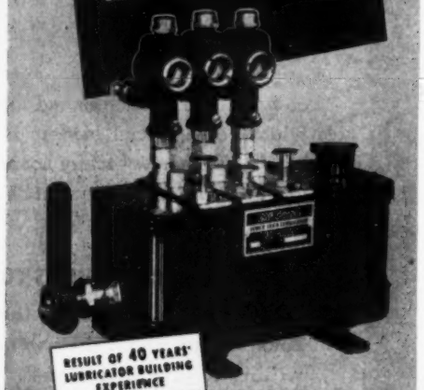
The Treasury Department acknowledges with appreciation the publication of this message by

VICTORY LOAN

R. T. Hartman

Editor—DIESEL PROGRESS

★ *This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and War Advertising Council* ★

McCORD
Class S.F.
LUBRICATORS
A modern lubricator for modern service on Diesel, gas, steam engines and compressors. Supplies dependable cylinder lubrication in metered quantities reducing friction and wear. Capacities: 2 to 24 pt. and 1 to 16 feeds. New catalog on request.

RESULT OF 40 YEARS' LUBRICATOR BUILDING EXPERIENCE
McCORD CORPORATION
DETROIT 11, MICHIGAN
LUBRICATOR DIVISION

Highest Quality
Gaskets & Oil Seals
by **FITZGERALD**
Gasket Craftsmen
for 39 Years
•
Gaskets of all types and materials to give reliable service under all Diesel operating conditions
•
For full information write —
THE FITZGERALD MANUFACTURING COMPANY
TORRINGTON, CONN.
Branches: Chicago, Illinois, Los Angeles, California
Canadian FITZGERALD, Limited, Toronto
FITZGERALD
SINCE 1896
GASKETS

JUST OFF THE PRESS

THE 1945 Edition of the DIESEL ENGINE CATALOG, Volume 10, is ready for distribution. It is the largest edition yet published—532 pages, hundreds of illustrations—a *Composite Catalog* of the *Entire Diesel Industry*. Page size 10⅛ in. x 13½ in.—a big book and a real value. A separate section devoted to each manufacturer's line of engines with completely illustrated descriptions and specifications—covering stationary, marine, automotive and railway types. Other sections cover Diesel accessories such as fuel injection equipment, chain and gear drives, electric, hydraulic and mechanical couplings, superchargers and many other items. Also contains a directory of products and manufacturers. An indispensable book for all interested in Diesels. Paper restrictions limit the supply so order your copy promptly—a convenient coupon will be found on page 130 of this issue.

Detroit Diesel Appoints New York Distributor

THE Diesel Marine and Equipment Corporation, 342 Madison Avenue, New York City, has been named marine sales and service distributor for the metropolitan New York area, western Connecticut, and northern New Jersey by the Detroit Diesel Engine Division of General Motors Corporation.

A. Jay Turk, president of this company, has had more than 25 years experience in sales, service and parts as a member of the field staff of the Detroit Engine Division. Prior to that he spent 17 years in the sales and service departments of Cadillac Motor Division in Detroit.

The new organization, Mr. Turk announces, offers the New York, New Jersey and Connecticut territories the services of an organization of

Pierce Governors
Standard Equipment on the world's leading Diesel Engines!
THE PIERCE GOVERNOR COMPANY, INC.
1603 OHIO AVE., ANDERSON, INDIANA

WAUSAU
PISTON RINGS
VALVE SEAT INSERTS
WAUSAU MOTOR PARTS CO.
2200 HARRISON STREET WAUSAU, WISCONSIN

CRACKED HEADS WELDED
• ENGINES REPAIRED
Satisfaction Guaranteed VALVE SEATS HARD SURFACED
BRODIE
AN ENGINEERING SERVICE
117 Clifton Pl.
Brooklyn,
New York

CASH IN ON YOUR IDEAS
For New Diesel Service Tools or Specialties!
Reliable Midwestern manufacturer wants marketable new products to supplement present line of Diesel specialties. Complete protection on your patents or patentable products, plus active sales promotion guaranteed.
Write today, briefly outlining your idea and its probable market. Send no drawings, blue-prints or models until requested. Address: Box 150, DIESEL PROGRESS, 2 W. 45th Street, New York 19, N. Y.

A. Jay Turk

factory trained sales and service personnel equipped with special tools and equipment to service the famous series "71" Diesel engine and all other General Motors Diesel engines. The new firm will carry a complete stock of Diesel engine parts.

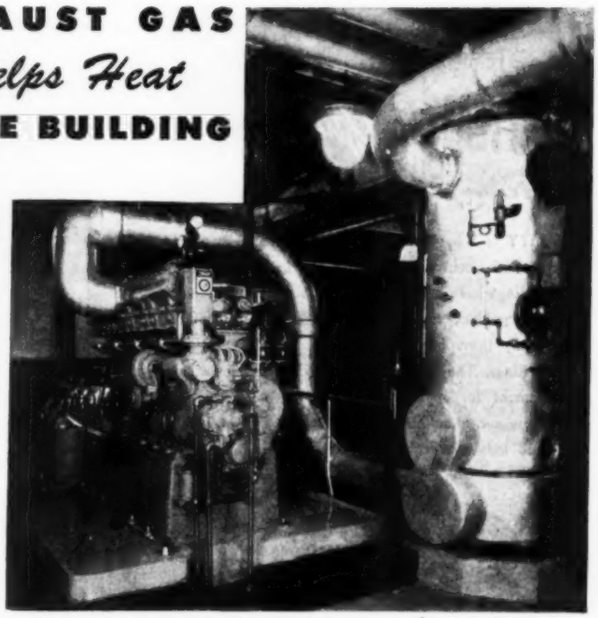
R. E. Nagel Joins Fluor

R. E. (BOB) NAGEL, formerly with the Universal Oil Products Company of Chicago has accepted a position with The Fluor Corporation, Ltd. and will be located at Fluor's New York offices as District Sales Manager.

R. E. Nagel

Mr. Nagel has been with the Universal Oil Products Company for the past twenty-four years during which time he served in various capacities; first as a draftsman, then followed assignments as supervising construction engineer, Superintendent of Construction and operator on experimental and commercial thermal cracking units and in their research and development department. For the past twelve years he has been in constant contact with various oil companies in the commercial development of refining processes and their problems.

SIMS EXHAUST GAS BOILER *Helps Heat* LARGE OFFICE BUILDING



Make your plans for this method of utilizing engine exhaust gas heat. At the right we show how the exhaust from a natural gas engine at 950°F is run thru a Sims Boiler to produce steam at 7 to 10 lbs. pressure to help heat a large office building. This is one of many methods of turning waste heat into profit heat described in the Sims Heat Recovery book of case studies. *Write for copy to-day.*

The SIMS COMPANY • BOX 1096C • ERIE, PA.

SIMS HEAT RECOVERY EQUIPMENT

HEAT EXCHANGERS • EXHAUST GAS BOILERS • ENGINE SILENCERS • STORAGE WATER HEATERS • OIL HEATERS • OIL COOLERS • FEED WATER HEATERS AND UNIT TYPE PULVERIZERS

Write for Bulletin 22-23-B-11

Capacity of each "R-C" Scavenging Blower in above installation exceeds 13,000 CFM. Speed 800 RPM; pressure 2¾ lbs.

at all operating speeds

Having a sustained high efficiency over the same speed range as Diesels, Roots-Connersville Rotary Positive Displacement Blowers are particularly suited for direct connection to these engines. Couple this with the positive pressure build-up, characteristic of "R-C" Blowers, and you have the two main reasons for their outstanding success in supercharging and scavenging applications. Your inquiries are invited regarding supercharging and scavenging problems.

ROOTS-CONNERSVILLE BLOWER CORP.
One of the Dresser Industries
510 Midland Avenue Connersville, Indiana

Roots CONNERSVILLE SINCE 1854 — *Supercharging and Scavenging* **BLOWERS**

FOR 25 YEARS AUTO-DIESEL has made Quality Rings!

QUALITY is a habit with our organization. For nearly a quarter of a century AUTO-DIESEL "Ladle Tempered" Piston Rings have been made with painstaking effort in order to produce rings of the highest quality. That is why many firms have standardized on AUTO-DIESEL Piston Rings. They are used as original equipment and replacement for Diesel powered units of all types—stationary and mobile units and hydraulic and pneumatic operated industrial equipment.

Write for Information

THE AUTO-DIESEL PISTON RING CO.
3151 SUPERIOR AVE. CLEVELAND 14, OHIO

QUALITY RINGS SINCE 1921

The Experience Resulting from 83 Years Devoted Exclusively to the Design and Application of Both Plain Mechanical and Hydraulic Types of Governors Is Available When You

SPECIFY PICKERING FOR YOUR ENGINES

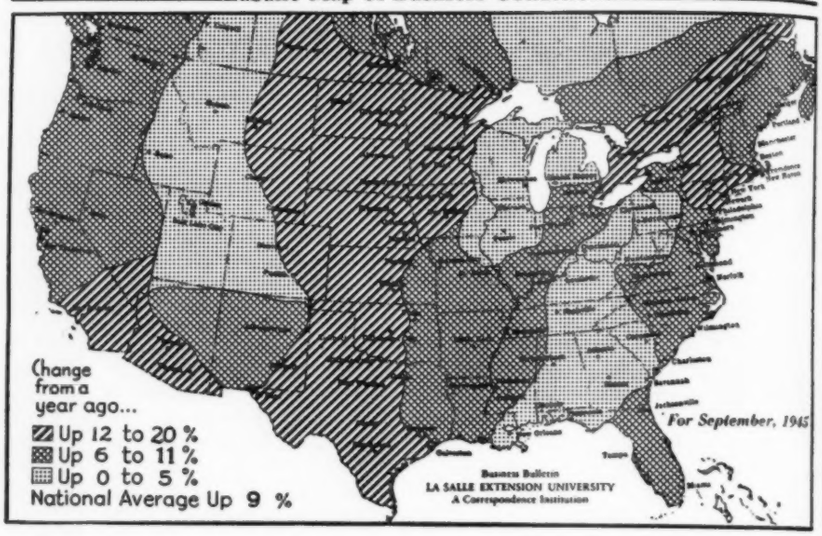
PORTLAND CONN.

DIESELS

240 HP Buckeye
Model "P" with Generator
3 cyl — 13½" x 18" — 300 RPM
Just Rebuilt
Owner must have the space.
BARGAIN

ROBERT SCHOONMAKER
Port Washington, Long Island, N.Y.
Phone Roslyn 1220

LaSalle Map of Business Conditions


Change from a year ago...
Up 12 to 20 %
Up 6 to 11 %
Up 0 to 5 %
National Average Up 9 %
For September, 1945
Business Bulletin
LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution

Business Activity Holds Up Well

Map Supplied by BUSINESS BULLETIN DIVISION of La Salle

During the first weeks of peacetime, the volume of trade and other business activity is being maintained at levels which are quite a little above a year ago. The decline in industrial production has not yet greatly affected other activities, although it will do so if it is long continued. The speed of reconversion and reemployment will determine the general trends during the fall months. The total volume of business, as measured by bank transactions, has been about 9 per cent higher than it was a year ago. Preliminary figures for the last week indicate some reduction from that high point.

While the general average is high, conditions are becoming more spotty and variations among different areas are greater than they have been during most of the time in recent years. Many shifts are being made which are having various effects throughout the country. The most striking general change is the relatively better showing made in the agricultural regions of the Middle West while activity is lagging slightly in industrial regions. Much of these differences is due to the very high rate of activity in industry a year ago.

In the New England states the trend is gradually upward in many lines where reconversion among the smaller companies has been more nearly completed than it has in most other places. The expansion in civilian production is more than offsetting the cutbacks in military orders. Some materials shortages are holding back expansion, but the situation is changing for the better rapidly.

The bright spot of the Atlantic coast region is New York city and the surrounding area. Troop movements from Europe as well as large foreign trade is helping maintain a high rate of activity. Some slowing down can be expected during the next few months but the general average will be high for some time.

Business is also holding up fairly well in many parts of the South, although in several places the gains over last year have been a little less than the national average. Agricultural conditions are fairly favorable even though the cotton crop is expected to be less than average. Spending in connection with the military camps is much less than it has been in recent years. These factors tend to keep business from gaining much in most areas.

In the agricultural section of the Middle West and South West, the gains over a year ago have been most striking. Crop prospects have improved considerably since the poor start in early summer and marketing of crops as well as of livestock have increased. If weather conditions remain good during the rest of the season and prices are still high, further expansion can be expected. Farm income is the best in many years.

Along the Pacific Coast activity is lagging somewhat, especially in the northern part. It is still very high, however, in comparison with prewar years and a considerable percentage of the industrial expansion in that area will be maintained in peacetime. Reconversion problems are usually difficult though, and a rather extended period of readjustment may be required.

In Canada, the trends in industry, trade and agriculture have been about the same as they have in the United States. The output of factories is a little lower than last year, but business volume is being maintained at a level somewhat above a year ago. Agricultural prospects in most sections of the country are quite favorable and total farm output will be high again this year. National income and consumer demand are large. Even after some decline, business activity will continue not far from the highs of the last two years.

DIESELS
ALL SIZES TYPES
A. G. SCHOONMAKER CO.
50 CHURCH ST. PHONE WORTH 2-0455
NEW YORK 7, N. Y.
BUSINESS ESTABLISHED 1898

PETROMETER
FOR TANK GAUGING EQUIPMENT FOR DAY TANKS & CLEAN OIL STORAGE
PETROMETER CORPORATION
5 STAR SQUARE, LONG ISLAND CITY, N. Y.

GRAYMARINE DIESELS

Since **Pearl Harbor,** engines bearing this nameplate have totalled over 50,000 units, better than eleven million horsepower, representing close to one fourth of the total propulsive horsepower installed by the U. S. Navy during the war. We have shipped them to 41 American Boat Yards, and to 55 other destinations.

The **record of these engines** in peacetime and in war reflects the competence of Gray in the marine field. The building and marketing of engines bearing this trademark is a continuous and continuing development, a piling-up of experience which gives fulfilment to improvement and progress, results always in better engines for the industry.

GRAY MARINE MOTOR COMPANY
Pioneers • Engineers • Leaders
DETROIT, ZONE 7, MICHIGAN

THINK of DUST CATCHERS now . . . for tomorrow's PASSENGER SHIPS

ars of service in the world's foremost passenger ships have demonstrated conclusively that ORTEX DUST CATCHERS

Keep decks and brightwork free of soot and passengers happy.
Cut cleaning, maintenance and painting to a minimum.
Eliminate fire hazard from stack sparks.
Are extremely low in operating cost.

f you ar conidering new ship construction or odernization of existing vessels, write for our est bulletin, No. 733. Or call our Engineering epartment for free consultation.

VORTEX DUST CATCHERS
Manufactured by
ENGINEERING SPECIALTIES CO., INC.
CORTLANDT STREET • NEW YORK 7, N. Y.

Specify
MANZEL LUBRICATORS
for YOUR Diesel Engines

Many leading Diesel manufacturers install Manzel Force Feed Lubricators as standard equipment—because Manzels have a reputation for supplying positive, dependable lubrication under the most severe conditions.

Easy-to-see sight glasses, accurate, positive feed, and day after day dependability make Manzel Model 94 Lubricators favorites with Diesel engineers. Manzels deliver exactly the right amount of oil, to the right spot at the right time.

Write for Catalog 94-B

MANZEL BROTHERS COMPANY
275-277 Babcock Street, Buffalo 10, N. Y.

L. A. Harlow Appointed Advertising Manager of Fairbanks-Morse

LEWIS A. (LEW) HARLOW recently took over the post of manager of the Advertising Division of Fairbanks, Morse & Co.

Lewis A. Harlow

In a manner of speaking, Mr. Harlow began training for the position at the early age of fourteen when he was editor, typesetter, and printer of his class paper at Milton Academy. Later, still pursuing the course he seemed destined to follow, he was made editor of the school paper in 1919—his last year. Incidentally, the Milton Academy paper was an outstanding paper of its type and carried considerable national advertising. From Milton Academy Mr. Harlow entered Harvard University and graduated with honors in 1922.

In 1943 he joined Fairbanks-Morse as Assistant Advertising Manager; and, until his recent advancement to the position of manager, helped supervise the many and varied advertising activities of the company. Lewis A. Harlow takes over his duties as Advertising Manager at the beginning of an unusual and interesting era, and his associates in the industrial and advertising fields wish him all success in his new capacity.

BUY VICTORY BONDS

POSITION WANTED
Marine Diesel Sales Engineer, N. Y. Area, 15 years successful Marine experience, tugs, fish boats, work boats, pleasure craft. Available in 30-days. For full particulars write Box 151, DIESEL PROGRESS, 2 W. 45th St., New York 19, N. Y.

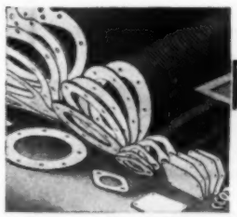
How Thousands of Gasket Improvements
are being effected by Fel-Pro Developments in
Thiokolized Gaskets

For that New Design . . . or Re-Design! *Investigate* the 2 BIG ADVANTAGES of Fel-Pro's Pioneering Development and Production of Thiokolized and other specially treated Gasket Materials.

Through Thiokolizing and other treatments of such gasket materials as Felpak, Karropak, Fishpaper, Chipboard, Fibre, Cork and others . . . a host of new, improved gaskets are being produced for thousands of America's leading manufacturers.

Most of these were developed originally to meet a specification . . . a car builder needed a more durable, oil resisting gasket . . . an electrical device maker, similar material with high insulating and sealing qualities . . . an auto accessory maker, an oil resisting gasket with tremendously high tensile strength . . . etc.

Fel-Pro has the Know-How to provide the proper gaskets for your requirements and the PRODUCTION KNOW-HOW to produce them ECONOMICALLY and to highest quality standards. *Write Today for* FREE PORTFOLIO OF LATEST SEALING MATERIALS *and further details of our* NO CHARGE CONSULTATION SERVICES.



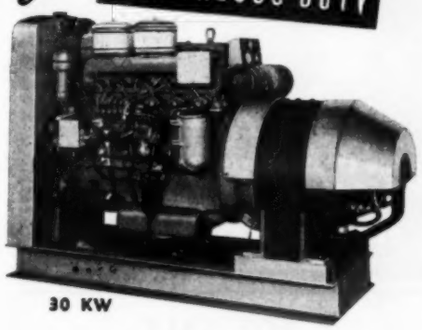
FEL-PRO tect

with Sealing Materials, Gaskets, Packing, Sound and Vibration Dampeners, Washers, specially die-cut, treated and fabricated by

1198

FELT PRODUCTS MFG. CO., 1522 CARROLL AVE., CHICAGO, ILL.

ELECTRICITY *for* STAND-BY SERVICE OR CONTINUOUS DUTY



30 KW

U. S. MOTORS CORP.
542 Nebraska Street
OSHKOSH, WISCONSIN

U.S. DIESEL
ELECTRIC PLANTS

OAKITE
SHORT CUTS
FOR Diesel OPERATORS

Jacket-Water Coolers Descaled Easier

When heat transfer efficiency goes down in shell and tube type coolers, the probable cause is an accumulation of lime scale on tube surfaces.

A time-saving, effective way to remove these deposits is to use Oakite Compound No. 32. An inhibited acid material, Oakite Compound No. 32 is diluted to desired concentration for each individual job's requirements... safely, completely removes insulating lime-scale and rust deposits to restore normal heat exchange efficiency. 28-page booklet gives details. Write for your free copy TODAY!

OAKITE PRODUCTS, INC.
22D Thames Street, NewYork 6, N.Y.
Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE *Specialized* CLEANING

SEAMLEX
THE
FLEXIBLE · *SEAMLESS* · ALL-METAL HOSE

FOR STEAM · WATER · OIL · CHEMICALS
GAS · AIR · ETC. *Literature on Request*

SEAMLEX COMPANY, INC.
27-22 Jackson Avenue, Long Island City 1, N.Y.

FOR SALE
NEW GENERATORS

10—New 125 KVA—100 KW 80% P.F. 3 phase, 60 cycle, 480 volt, 514 RPM horizontal single bearing, damper windings, *Electric Machinery* synchronous generators complete with V-belt driven exciters and rheostats.

EUCLID ENGINEERING CORP.
608 National City Bank Building
Cleveland 14, Ohio

WEST COAST DIESEL NEWS

By JIM MEDFORD

LAUNCHED by the Albina Engine & Machine Works, Portland, Oregon, for British interests, the 319-ft. coastal *Oregon Fir* has two supercharged 1,200 hp. Union Diesels, main engines; three Worthington Diesels with Elliott generators, and a Hill Diesel turning emergency generator.

OWNED by Mrs. Mary Lucido Hardee of San Francisco, the 85-ft. purse seiner *St. Anne* powered with a 400 hp. Enterprise Diesel is nearing completion at the Master Builders, Alameda, Calif.

THE Ballard Marine Railway, Seattle, Washington, has repowered the San Juan Packing Co.'s 65-ft. *Betty* with a 135 hp. Caterpillar marine Diesel replacing a 65 hp. Diesel of another make.

BUILDING at the Western Boat Building Co., Tacoma, Washington, the 65-ft. combination fish boat to be operated by Clarence Payne and associates, has a Caterpillar marine Diesel with Twin disc gears.

LAUNCHED at Bay City, Oregon, the 70-ft. dragger *Capt. Ludwig* for Christensen Bros., has a 170 hp. Buda main Diesel and a Caterpillar Diesel auxiliary.

FROM Ed Monk's designs, Chambers Boat Co., Seattle, Washington, is building for Tom Rustad a 46-ft. halubuter with a 125 hp. Mack Mariner Diesel.

ANOTHER Monterey purse seiner gets a bigger marine Diesel—Capt. Shedo Russo, owner of the 85-ft. *Juanita* is awaiting delivery of a new 250 hp. Atlas Imperial engine.

Photoelectric
CRC SMOKEMETER

Objective indication of smoke density, independently of human judgment and of light conditions.
Approved by the Coordinating Fuel Research Committee. Manufactured by

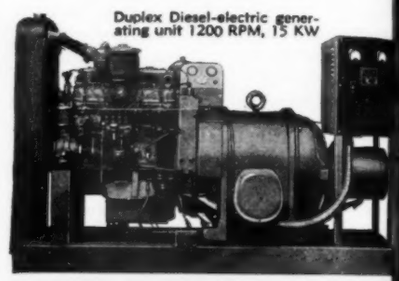
PHOTOVOLT CORP.
95 Madison Ave. New York 16, N. Y.
Write for Literature

Generating Units
5 K.W. to 100 K.W. A.C. or D.C.

Close regulation of voltage and frequency is an outstanding feature of the generating units we build with either Diesel or gasoline prime movers. We are also equipped to supply any type of instrument panel required.

Manufacturers of engine generator sets for over 20 years.

Duplex Diesel-electric generating unit 1200 RPM, 15 KW



Duplex Truck Co.
Lansing, Michigan

The Modern
GAS TURBINE

By R. TOM SAWYER, M.E., E.E., Engineer, Diesel equipment, American Locomotive Company; Chairman, Co-ordinating Committee on Gas Turbines of A.S.M.E.

Its Uses as an Exhaust Turbo-supercharger or Prime Mover in All Fields of Service, including JET PROPULSION

Just published, this new work brings together in one compact volume a great wealth of authoritative information on the gas turbine. It traces the history of this power device from its earliest inception down to its latest applications in all fields of service on land, on sea, and in the air. Briefly, here are some of the principal topics covered in the 10 chapters:

- **Construction and operation of the modern gas turbine**
- **advantages of the gas turbine as a supercharger**
- **history of inventions in the field**
- **how turbocharging increases engine power**
- **efficiency of the internal combustion turbine and factors in performance; mechanical aspects**
- **use of gas turbines in industry, diesel electric locomotive, marine service**
- **use of turbosuperchargers in the aircraft engine**
- **operation of the jet propelled plane**

PROFUSELY ILLUSTRATED! Author has included 131 line drawings, halftones, blueprints of various types of gas turbines, charts, graphs, and tables.
216 Pages 6 x 9 Inches $4.00

Mail Your Order Today To

DIESEL PROGRESS
2 WEST 45th ST., NEW YORK 19, N. Y.

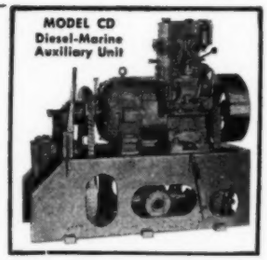
CONTROL MEANS FOOLPROOF CONTROL

Finger Tip
REMOTE CONTROL

...aneous, foolproof, single lever operation ...h reverse gear and throttle. Battle-tested ...battle-proven to be the most outstanding ...reliable remote control system made.

...NISH CONTROLS
...GEPORT 5, CONNECTICUT

SPACE SAVER!
POWER
LIGHT
WATER
AIR
All In One Compact Package!



...INE—8 h.p.
...ERATOR—3½ or 5 kw.
...COMPRESSOR—11 or 20 c.f.m.
...—60 or 90 g.p.m. at 60#
Weight—1,400 to 2,400 lbs., depending upon capacities.
...combinations to 10 kw. and Diesel-Generator sets ...ble.

WRITE FOR BULLETIN 151

...STER-BLACKSTONE, INC.
...South 68th Street MILWAUKEE, WISCONSIN U. S. A.

NORMA-HOFFMANN

PRECISION BEARINGS
FOR EVERY LOAD, SPEED, AND DUTY
108 DISTINCT SERIES
OVER 3000 SIZES
BALL, ROLLER and THRUST
...to 22½" Bore—Metric and Inch Sizes
Write for the Catalog and Engineering Counsel
NORMA-HOFFMANN
BEARINGS CORP'N, STAMFORD, CONN.
FOUNDED 1911

BUILT for use in Iceland by Capt. Ingvar Einersson, Pacific Boat Building Co., Tacoma, Washington, will power the unnamed 85-ft. seiner boat with a 320 hp. Atlas Imperial marine Diesel.

PRESENTED at key places on the Pacific Coast, a three-day course of instruction on Diesel engine practice has been given to Coast Guard Auxiliary and Temporary Reservist men by Tom J. Hall, Service Engineer of the Gray Marine Motor Co. Movies and slides prepared at factory stress trouble-shooting.

ADDING to the fleet of Atlas powered craft working in Alaska waters, Nels Larson's new fish boat built at Ketchikan, Alaska, gets a 4-cylinder 60 hp. marine Diesel.

POWERED with a General Motors 82 hp. marine Diesel with Twin Disc gears, the combination fish boat *United No. 1* of Fort Bragg, California, by Fred Hyman for his brother Frank is also from Ed Monk designs. Batteries are Exide.

BUILT at Tofino, Vancouver Island, B. C., the 48-ft. *Casey B* is powered with a 135 hp. Cummins marine Diesel and will fish out of Vancouver for Kenneth Bird.

POWERED with 70 hp. Caterpillar marine Diesels, Norman Ryall and Gordon Gibbons have taken delivery of two new 48-ft. fish boats built by A. C. Benson yards, Vancouver, B. C.

DESIGNED by Naval Architect Harold Lennon, Consolidated Steel yards at Newport Harbor, California, will build an all-steel 125-ft. clipper for Van Camp Sea Food Co. Engines are all Atlas Diesels—900 hp. supercharged, main, and two auxiliaries.

OF extra heavy construction, the 45-ft. beam trawler *Shrimper,* for Reliance Shrimp Co., Wrangell, Alaska, by Hansen Bros. Boat Shop, Seattle, Washington from designs by H. C. Hansen, will be repowered with a 60 hp. Caterpillar marine Diesel.

CALISTAR, new tuna clipper by Harbor Boat Building Co., Terminal Island, California for Terminal Island Sea Foods, has a 600 hp. Elliott-Buchi supercharged Enterprise Diesel and two 115 hp. Caterpillar auxiliary Diesels.

HUSTLER, 66-ft. trawl boat *Hustler* by Western Boat Building Co., Tacoma, Washington, for Ellamar Packing Co., from designs by Don Hansen, N. A. will have a 135 hp. Caterpillar marine Diesel.

WHEN YOU NEED
PRECISION-BUILT
SMALL PUMPS
...Specify TUTHILL

A Handful of Pump for Pressure Lubrication

Remarkably small and compact in size, Tuthill Model L pumps do a man-sized job in pressure lubrication service. These internal-gear rotary pumps feature the patented Tuthill mechanical seal. They are equally outstanding for hydraulic applications, fuel oil and liquid transfer. Capacities from .33 to 3 g.p.m. at pressures up to 400 p.s.i. Ring or foot-mounted. Many porting arrangements available. Write for Model L Industrial Bulletin.

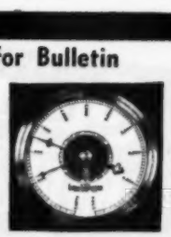
TUTHILL PUMP COMPANY
939 EAST 95TH STREET, CHICAGO 19, ILLINOIS

Stop
ALL Leaks

SERVING THE
UNITED NATIONS
WITH DEPENDABLE
GASKETS FOR EVERY APPLICATION

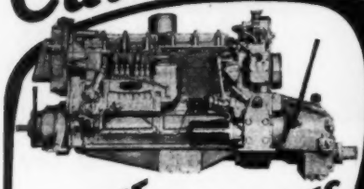
DETROIT GASKET & MFG. CO.
DETROIT 22, MICH.

Write for Bulletin
CHECK
YOUR FUEL
SUPPLY
AT A
GLANCE



THE LIQUIDOMETER CORP.

"Caterpillar"



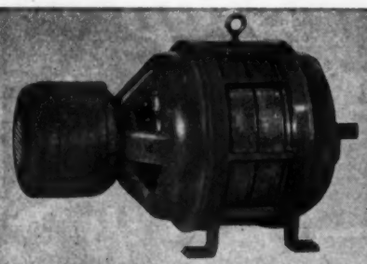
MARINE DIESEL ENGINES

PROPULSION - AUXILIARY
STATIONARY POWER UNITS
ELECTRIC GENERATING PLANTS

H.O. PENN MACHINERY CO.
INCORPORATED
140th STREET & EAST RIVER, NEW YORK 54, N. Y.

BRANCHES
MINEOLA, LONG ISLAND. POUGHKEEPSIE, N. Y.
NEWINGTON, CONNECTICUT.

MILWAUKEE OIL RE-REFINING EQUIPMENT
(VACUUM PROCESS)
For Marine & Stationary
Internal Combustion Engines
HOLCOMB ENGINEERING COMPANY
77-35 113th STREET
FOREST HILLS • NEW YORK



Columbia A.C. and D.C. Generators are built to meet highest performance standards. Complete range of application, including light, power, ship auxiliaries, or custom designed units.

D.C. UNITS range from 7½ to 200 KW.
A.C. UNITS range from 6¼ to 300 KVA.
Speeds and other specifications to meet requirements. Write for full information.

COLUMBIA ELECTRIC MFG. CO.
4510 Hamilton Ave., N.E., Cleveland 14, Ohio

COLUMBIA
GENERATORS
A.C. and D.C.

ADVERTISERS' INDEX

Aerofin Corporation 86
Aircraft & Diesel Equipment Corp. 90
Aluminum Co. of America 109
American Air Filter Co., Inc. 113
American Bearing Corp. 26
American Bosch Corp. 38-39
American Locomotive Co. 14-15
American Tube Bending Co. 100
Atlas Imperial Diesel Engine Co. 22-23
Auto-Diesel Piston Ring Co., The 134

Baldwin Locomotive Works, The 89
Borg-Warner Corp. 34
Brad Foote Gear Works 42
Brodie System, Inc. 132
Buckeye Machine Co. 116
Buda Co., The 17
Bunting Brass & Bronze Co., The 43
Burke Electric Co. 105

Campbell, Wyant & Cannon Foundry Co. 33
Candler-Hill Corp. 119
Chicago Screw Co., The 112
Cities Service Oil Co. 85
Cleveland Diesel Engine Div., General Motors Corp. 70-71
Columbia Electric Mfg. Co. 138
Cooper-Bessemer Corp. ..... Fourth Cover
Cummins Engine Co. 29

Delco Products Div. 11
Delco-Remy Division 51
DeLuxe Products Corp., The 8
Detroit Diesel Engine Div., General Motors Corp. 92-93
Detroit Gasket & Mfg. Co. 137
Diesel Engineering & Mfg. Corp. 31
Dollinger Corporation 10
Dresser Industries, Inc. (See Roots-Connersville Blower Corp.) 133
Duplex Truck Co. 136
Durabla Mfg. Co. 5

Electric Auto-Lite Co., The 79
Electric Machinery Mfg. Co. 114-115
Elliott Company ..... Third Cover
Engineering Specialties, Inc. 135
Enterprise Engine & Foundry Co. 36
Erie Forge Company 125
Euclid Engineering Corp. 136
Ex-Cell-O Corporation 111

Fairbanks, Morse & Co. 2-3
Farrel-Birmingham Co., Inc. 88
Federal-Mogul Corp. 6
Felt Products Mfg. Co. 135
Fitzgerald Mfg. Co. 132
Fluor Corporation, Ltd., The 16
Fulton Iron Works Co. 122

General Machinery Corp. 121
General Motors Corp., Cleveland Diesel Eng. Div. 70-71
Detroit Diesel Engine Div. 92-93
Globe-Union, Inc. 126
Goetze Gasket & Packing Co., Inc. 50
Gray Marine Motor Co. 135
Gulf Oil Corp. 35

Hall Mfg. Co., The 128
Harrison Radiator Div., General Motors Corp. 41
Holcomb Engineering Co. 138

Illinois Testing Laboratories, Inc. 98
International Harvester Co. 99

Koppers Company, American Hammered Piston Ring Div. 46
Korfund Company 120
Kurz & Root Co. 128

Ladish Drop Forge Co. 2
Lanova Corporation 3
Lawson Machine & Tool Co. 10
Leece-Neville Co., The 4
Liquidometer Corp., The 13
Lister-Blackstone, The 13

McCord Corporation 13
McQuay-Norris Mfg. Co. 4
Manzel Bros. Co. 13
Marine Products Co. 2
Marquette Metal Products Co. 8
Maxim Silencer Co., The 7
Moran Towing & Trans. Co., Inc. 12
Murray & Tregurtha, Inc. 4

National Bearing Div., American Brake Shoe Co. 1
National Forge & Ordnance Co. 3
National Supply Co., The 9
Nordberg Mfg. Co. 4
Norma-Hoffmann Bearings Corp. 13
Nugent & Co., Wm. W. 11

Oakite Products, Inc. 13
Ohio Crankshaft Co., The 11

Panish Controls 13
Parker Appliance Co., The 4
Pedrick Piston Rings 12
Penn Electric Switch Co. 1
Penn Machinery Co., Inc., H. O. 13
Petroleum Solvents Corp. 12
Petrometer Corp. 13
Photovolt Corp. 13
Pickering Governor Co., The 13
Pierce Governor Co., The 13
Propeller Club 10

Roots-Connersville Blower Corp. 13
Ross Heater & Mfg. Co. 10

Saginaw Malleable Iron Div. 2
Sarco Co., Inc. 12
Schoonmaker Co., A. G. 13
Schoonmaker, Robert 13
Scintilla Magneto Div., Bendix Aviation Corp. 12
Sealed Power Corp. 1
Seamlex Company, Inc. 13
Shell Oil Co., Inc. 5
Sims Company, The 13
Sinclair Refining Co. 8
Socony-Vacuum Co., Inc. 1
Sperry Gyroscope Co., Inc. 9
Sperry Products, Inc. 9
Star Electric Motor Co. 1
Sterling Engine Co. 2
Stewart Iron Works Co., Inc., The 10
Sun Oil Company 5

Texas Co., The ..... Second Cover
Tide Water Associated Oil Co. 20-21
Tuthill Pump Company 13

United States Gauge Co. 4
U. S. Motors Corp. 13

Van Dorn Iron Works Co., The 9
Victor Mfg. & Gasket Co. 8
Vortox Company 10

Walworth Co. 11
Wausau Motor Parts Co. 13
Weatherhead Company, The 8
Westinghouse Electric Corporation 10
Weston Electrical Instrument Corp. 9
Wilkening Mfg. Co. 12
Worthington Pump & Machinery Corp. 9

Young Radiator Co. 10
Youngstown Miller Co. 4